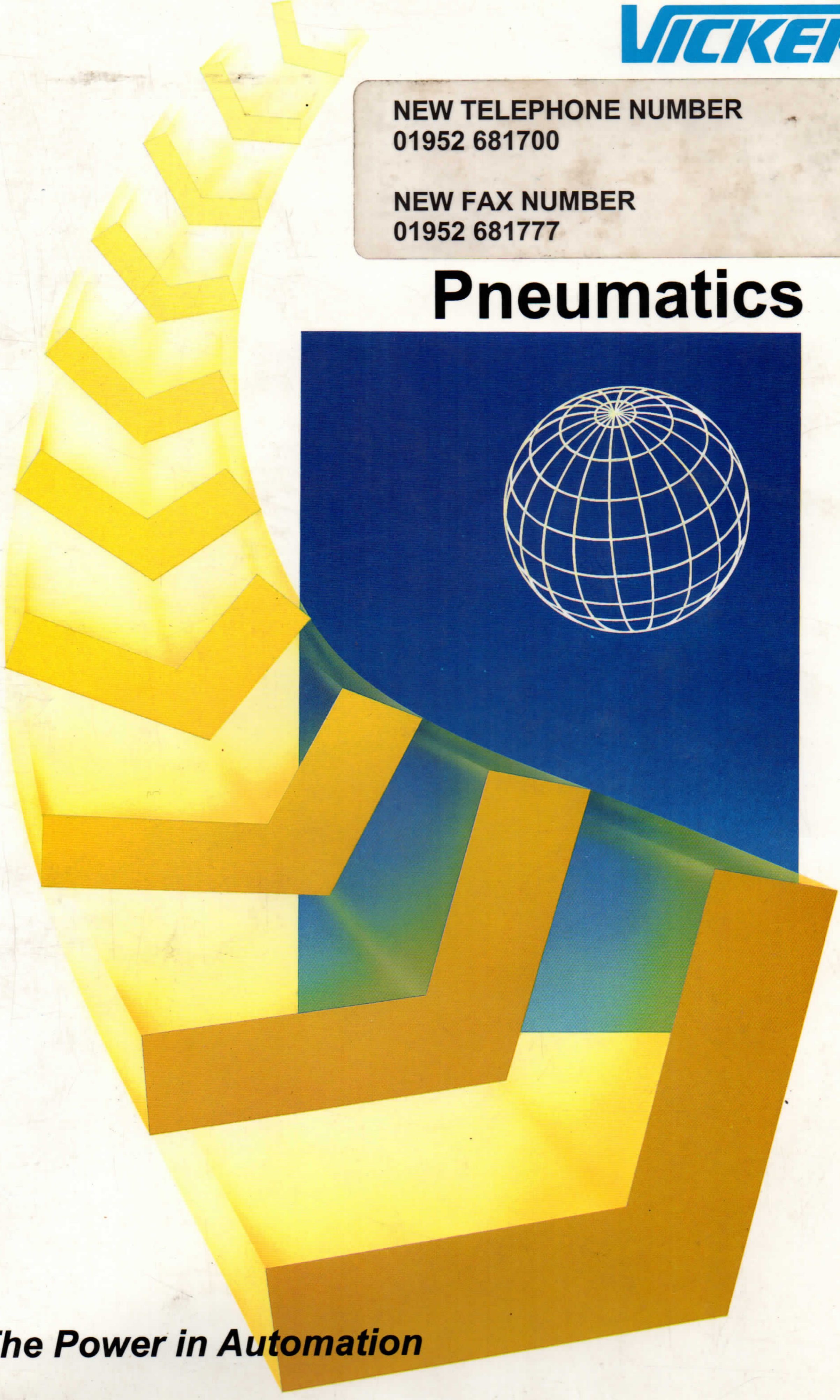
VICKERS

NEW TELEPHONE NUMBER
01952 681700

NEW FAX NUMBER
01952 681777

Pneumatics



The Power in Automation

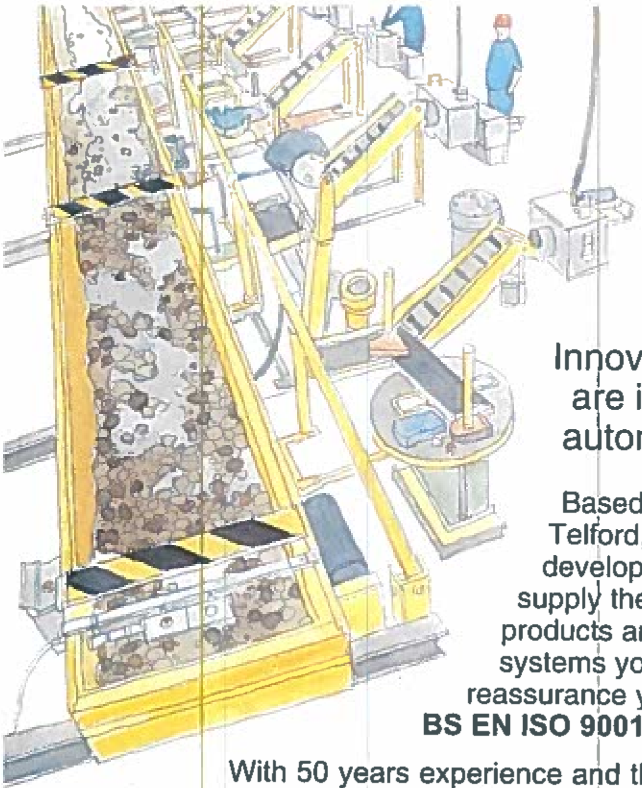
VICKERS

Pneumatics

APPROVED TO BS EN ISO 9001
QUALITY STANDARD
CERTIFICATE No. Q10706

PRODUCT SELECTOR - CONTENTS

The Power in Automation

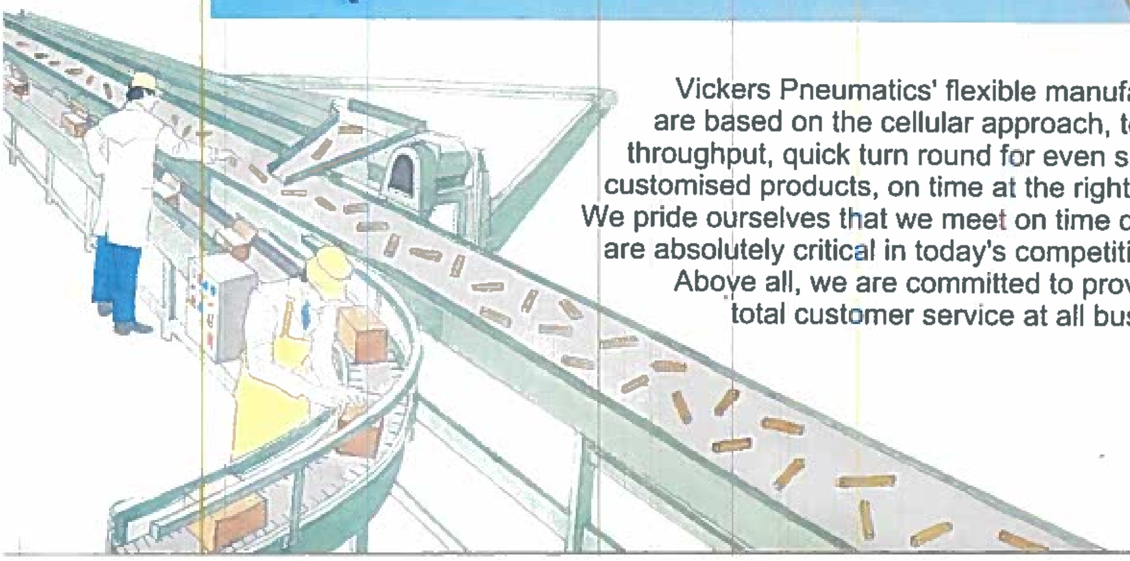


INNOVATION

Innovation is the reason why Vickers Pneumatics are in such a controlling position in total automation today.

Based at our modern facility in Telford, **Vickers Pneumatics** develop, manufacture and supply the new generation products and integrated control systems you need, with all the reassurance you would expect from a **BS EN ISO 9001** registered company.

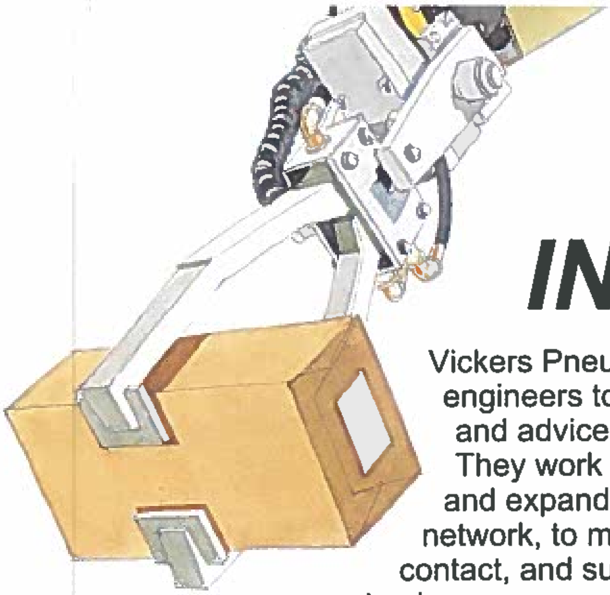
With 50 years experience and the worldwide Vickers organisation behind us, we have the electropneumatic experience to stay at the forefront of technological advancement in electronics, electromechanics and pneumatics.



Vickers Pneumatics' flexible manufacturing systems are based on the cellular approach, to provide fast throughput, quick turn round for even special customised products, on time at the right price.

We pride ourselves that we meet on time deliveries, which are absolutely critical in today's competitive market place.

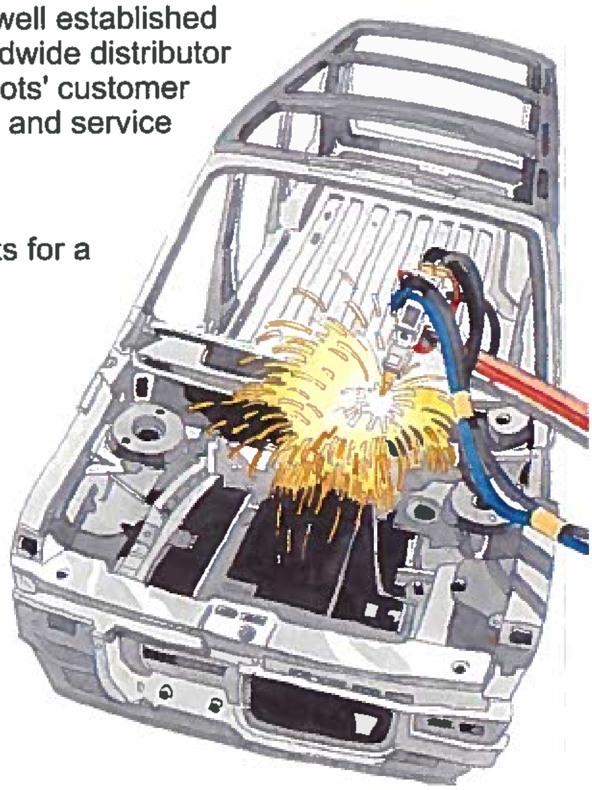
Above all, we are committed to providing you with total customer service at all business levels.



IN CONTROL

Vickers Pneumatics provide a team of fully qualified engineers to offer comprehensive technical support and advice.

They work together with a well established and expanding UK and worldwide distributor network, to maintain 'grass roots' customer contact, and supply full training and service back-up on an ongoing basis.

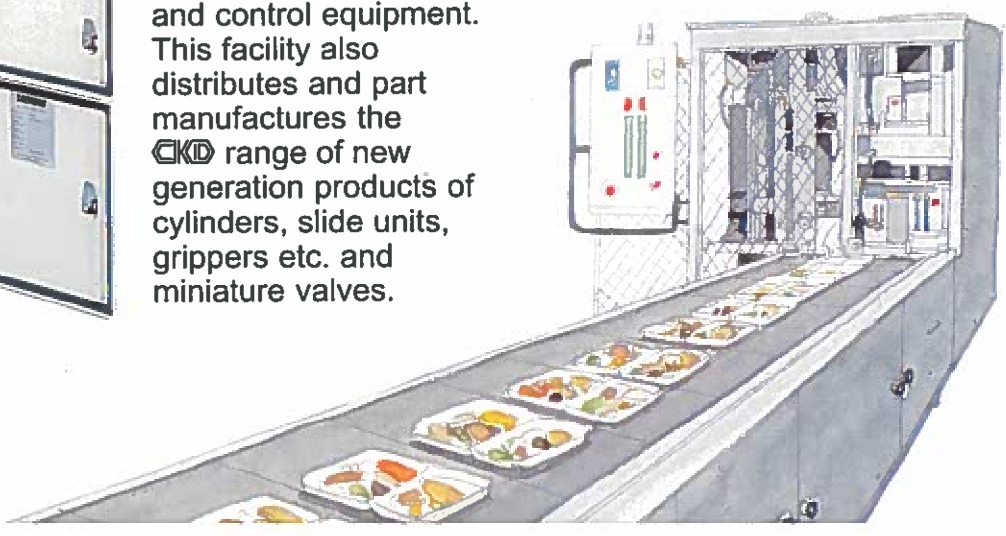


Vickers Pneumatics markets its state-of-the-art products for a wide range of applications, including:

- ★ PACKAGING
- ★ SPECIAL PURPOSE MACHINES & MACHINE TOOLS
- ★ FOOD PROCESSING
- ★ MATERIALS / MECHANICAL HANDLING
- ★ AUTOMOTIVE
- ★ TRANSPORT
- ★ CONTROL SYSTEM MANAGEMENT
- ★ TOTAL AUTOMATION

To meet the requirements of our customers, we manufacture and supply an extensive range of pneumatic control equipment. It incorporates state-of-the-art technology, including cylinders, directional control valves, air preparation equipment, electronics, and customised electropneumatic system building.

Vickers Pneumatics manufacture the **LANG** range of pneumatic cylinders, directional control valves and ancillary products at the Telford factory as well as a range of air treatment and control equipment.
This facility also distributes and part manufactures the CKD range of new generation products of cylinders, slide units, grippers etc. and miniature valves.



VICKERS PNEUMATICS ARE IN CONTROL

Product commitment

This pneumatic product selector details a wide range of new generation products which are widely used on a regular basis. The majority of products are of British manufacture, either the LANG Pneumatic range or under licence from the CKD product range.
Our commitment is to continually expand and improve our product portfolio to meet the challenges demanded by the innovative automation markets of today.

Global quality commitment

Vickers is dedicated to a policy of providing quality products and services that fully satisfy our customers' needs on a worldwide basis. Only our ongoing commitment to 'TOTAL QUALITY' throughout our business and working both with our suppliers and customers in partnership shall we meet our mutual quality goals.
For Vickers Pneumatics the Vickers Quality Improvement Process (VQIP), which includes certification to **ISO 9001** for all worldwide locations, is the way we do business today - and the way we will continue to do business tomorrow.

Warranty commitment

2 years

The Vickers Pneumatics product ranges have warranty from defects in material and workmanship for a period of **2 years** from date of supply providing the products or systems are used in the correct manner.
If a failure should occur during the warranty period the faulty product will be repaired or replaced within 24 hours of receipt.
Note: Vickers Pneumatics cannot be held responsible for incorrect application or use of the product, nor any liability or loss howsoever arising.

After-market commitment

5 years

Spares of consumable items for Vickers pneumatic products will be available in kit form during the production life of the product and for a period of **5 years** after the phase out of any product.

Safety commitment

There are numerous safety regulations relating to pressure systems and directives on machine safety. The chain of responsibility extends from the component manufacturing to the system/ machine manufacturer with the user ultimately responsible for ensuring compliance with the regulations.
Machinery (safety) Regulations 1992, BS (British Standard) reference EN 292 Part 1 and Part 2 will be further supported by European Norm EN 983 Safety Requirement for Fluid Power Systems and components "Pneumatic" to be published in 1995.
Compressed air should always be prepared for use correctly at all times, the customer shall ensure that the environmental conditions at the place of use shall be taken into consideration and whenever possible silencers, exhaust cleaners and bowl guards etc. shall be fitted to meet COSHH regulations.
We at Vickers Pneumatics are only too willing to work in partnership with the entire supply chain to ensure the correct use of our equipment. Further information on safety is given in leaflet "Working Safely with Pneumatics" available free of charge on request.

Vickers Systems Division, TRINOVA Limited, Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel:- (01952) 586000 Fax:- (01952) 586798

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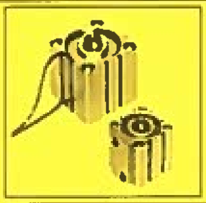
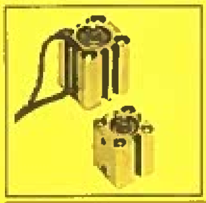
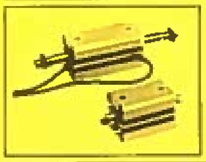
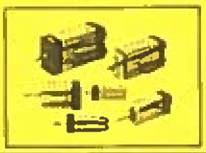
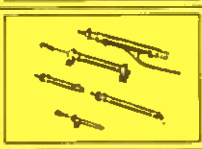
CERTIFICATE No. Q10708

PNEUMATIC ACTUATORS, SLIDE UNITS GRIPPERS and SHOCK ABSORBERS

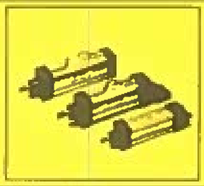
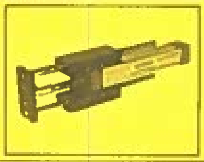
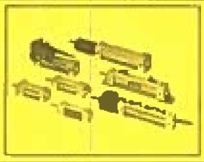
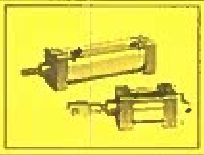
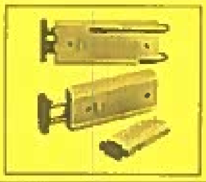
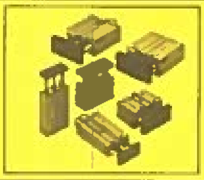
Pneumatic actuators

		Series	Single acting	Double acting	Bore sizes (mm)	Stroke range (mm)	Magnetic sensing	Page numbers
Super compact cylinders		SSD SSD-L		✓	12, 16, 20, 25, 32, 40, 50, 63	5 - 50 + Special strokes	✓	SSD 1.1 SSD 1.2 SSD 4.1 SSD 4.2
		SSD-X SSD-XL	✓		12, 16, 20, 25, 32, 40, 50	5 - 20	✓	SSD 2.1 SSD 2.2 SSD 4.1 SSD 4.2
		SSD-D SSD-DL		✓ Through rod	12, 16, 20, 25, 32, 40, 50, 63	5 - 50 + Special strokes	✓	SSD 3.1 SSD 3.2 SSD 4.1 SSD 4.2
Stopper cylinders		STK	✓ Spring extend	✓ ✓ Spring extend	20. 32 40, 50	10, 15, 20 20, 25, 30	✓ ✓ ✓	STK 1.1 to STK 1.7 STK 2.1
Super mount cylinders		SMD2 SMD2-X SMD2-Y SMD2-M	✓	✓ ✓ Non rotating	6, 10, 16, 20, 25, 32	5 - 50 5 - 15 5 - 50	✓ ✓ ✓	SMD 1.1 to SMD 6.2
Pencil cylinders		SCPS	✓		2.5 4	5 - 10 5 - 20		SCPS 1.1 SCPS 1.2
ISO 6432 Miniature cylinders		C	✓	✓	10, 12, 16, 20, 25	10 - 50 10 - 200	✓ ✓	CC 1.1 to CC 4.2

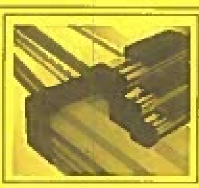
SECTION 1

PNEUMATIC ACTUATORS, SLIDE UNITS GRIPPERS and SHOCK ABSORBERS

Pneumatic actuators *(continued)*

		Series	Single acting	Double acting	Bore sizes (mm)	Stroke range (mm)	Magnetic sensing	Page numbers
ISO 6431 VDMA *EUROMIDAS* cylinders		C CE		✓	32, 40, 50, 63, 80, 100	25 - 320 + Special strokes	✓	EM 1.1 to EM 4.2
ISO 6431 *EUROMIDAS* rod guided cylinders		CG		✓	32, 40, 50, 63, 80, 100	25 - 320 + Special strokes	✓	CG 1.1 to CG 2.1
ISO 6431 *MIDAS II* power cylinders		MZ MZE		✓	32, 40, 50, 63, 80, 100	25 - 320 + Special strokes	✓	MZ 1.1 to MZ 5.2
ISO 6431 Power cylinders		MZ MZE MD MDE		✓	125, 160, 200, 250, 320	As required	✓	M 1.1 to M 4.1
Twin rod cylinders		STR		✓ Slide bearing ✓ Roller bearing	6, 10, 16, 25	10 - 100	✓ ✓	STR 1.1 STR 1.2 STR 1.3 STR 2.1
Rod guided cylinders		STS STL		✓ Slide bearing ✓ Roller bearing	20, 25, 32, 40, 50, 63, 80	25 - 200	✓ ✓	STS 1.1 to STS 2.2

Rodless cylinders

		Series	Single acting	Double acting	Bore sizes (mm)	Stroke range (mm)	Magnetic sensing	Page numbers
Rodless cylinders		SRL2 SRL2-G SRL2-Q		✓	12, 16, 20 25, 32, 40 50, 63, 80 100	200 - 5000	✓	Ask for details

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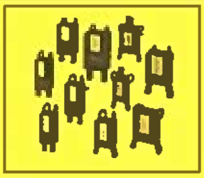
PNEUMATIC ACTUATORS, SLIDE UNITS GRIPPERS and SHOCK ABSORBERS

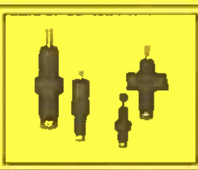
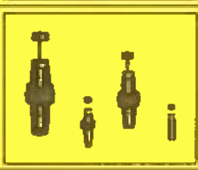
Slide units

		Series	Single acting	Double acting	Bore sizes (mm)	Stroke range (mm)	Magnetic sensing	Page numbers
Unit cylinders		UCA2		✓ Slide bearing ✓ Roller bearing	10, 16, 25, 32	25 - 200	✓ ✓	UCA2 1.1 UCA2 1.2 UCA2 1.3 UCA2 1.4
Linear slide cylinders		LCY LCY-A		✓ Standard type ✓ Reduced piping type	10, 16, 20, 25	15 - 100	✓ ✓	LCY 1.1 to LCY 2.2

Grippers

		Series	Single acting	Double acting	Bore sizes (mm)	Stroke range (mm)	Magnetic sensing	Page numbers
Air grippers		FH100 FH500		✓ Parallel ✓ Fulcrum	10, 12, 16, 20, 25 10, 12, 16, 20	8 - 20 (Open / Close) 20° to -5° (Open / Close)	✓ ✓	FH 1.1 FH 1.2 FH 1.3 FH 2.1

Shock absorbers

		Series	Function	Stroke (mm)	Impact speed	Absorption energy	Page numbers
Shock absorbers		NCK	Fixed capacity	8 to 30	1.5 to 3.0 m/sec	0.7 to 20.0 kgf.m	NCK 1.1 NCK 1.2
Shock absorbers		SCK	Adjustable capacity	7 to 70	1.0 to 4.0 m/sec	0.005 to 60.0 kgf.m	SCK 1.1 SCK 1.2 SCK 1.3 SCK 1.4

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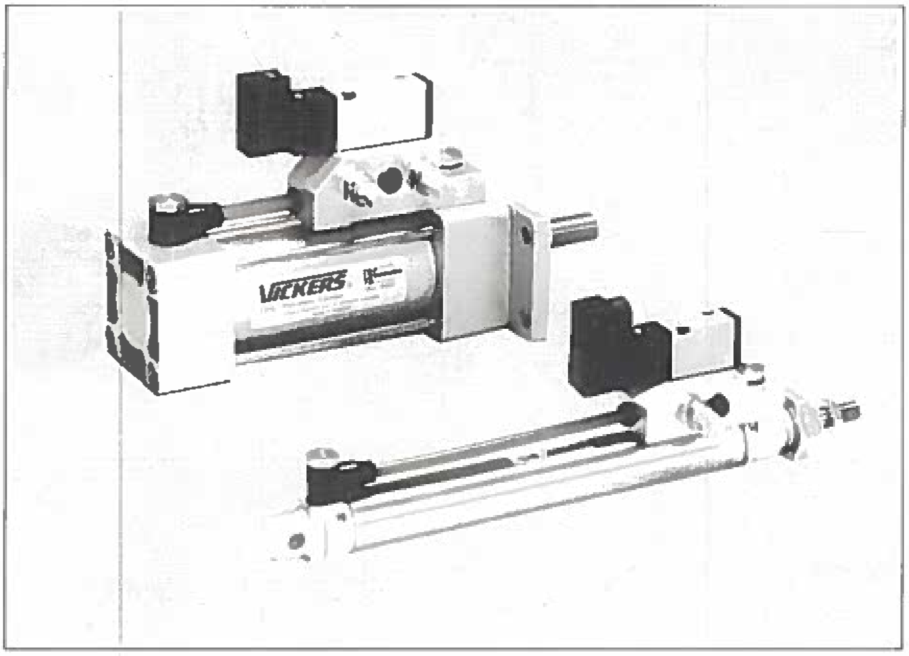
SECTION 1

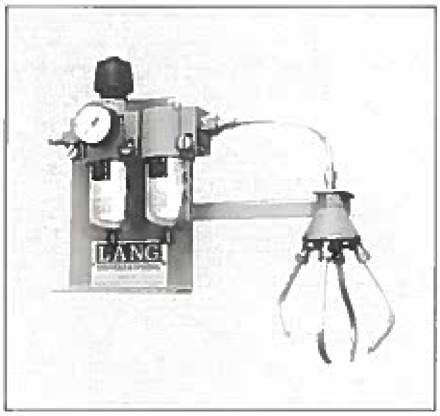
PNEUMATIC ACTUATORS, SLIDE UNITS GRIPPERS and SHOCK ABSORBERS

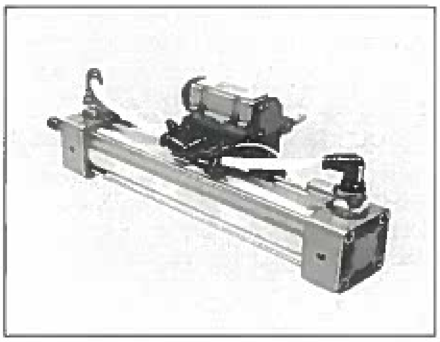
The Power in Automation

Valve/cylinder assemblies

Any type of assembly incorporating cylinders, valves, flow regulators, limit sensors, air preparation equipment etc. can be supplied to meet customers specific requirements.



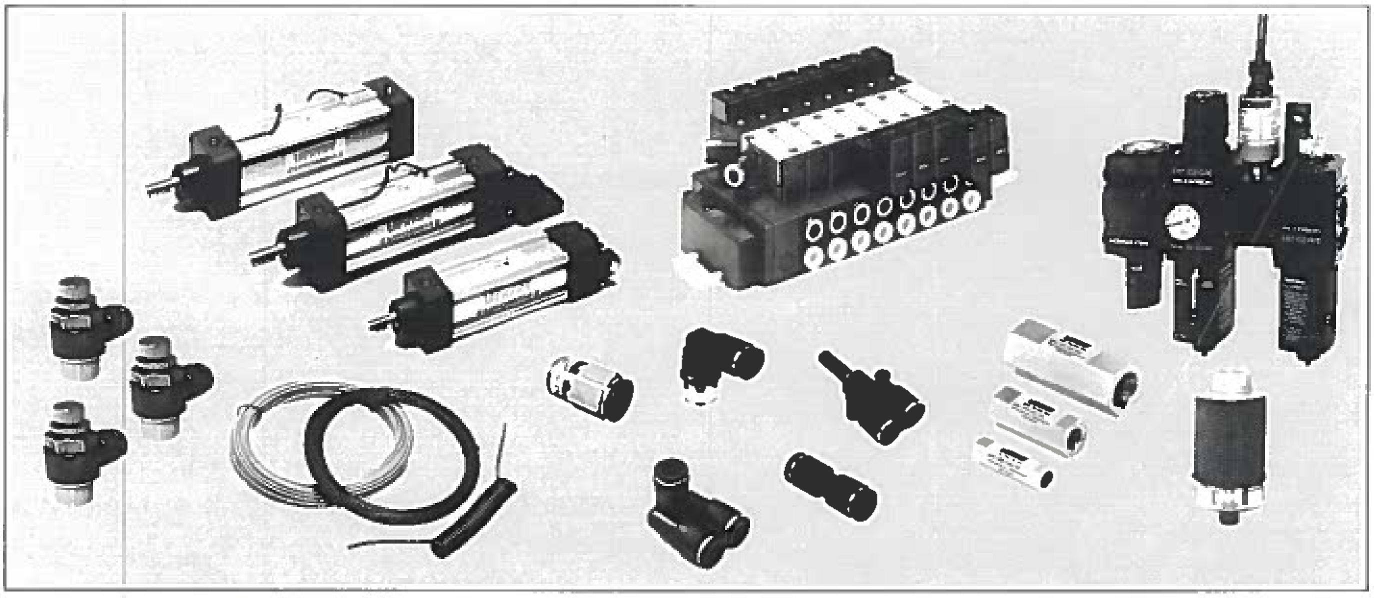




Valve/cylinder units can be supplied for simple operation employing any method of valve actuation or for special applications such as reciprocating operation of the cylinder.
Valves are fitted to mounting plates or manifold blocks attached either directly to a cylinder port or to the cylinder tie rods and all local piping can be fitted leaving the customer to provide external connections only.
The customer must provide full specifications to enable the unit to be designed to meet the operational requirements.

"One stop shop" KIT service

In addition to panel and cylinder/valve assemblies Vickers Pneumatics offer customers the ease of a one line order where all products, whether they are loose items of components or a combination of cylinders, fully assembled valves, control panels, tube, fittings etc., can be ordered in one kit of parts.
This offers the customer the saving in time of inventory control, ordering procedures and management which gives a lower end cost to the machine builder



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Printed in Great Britain GB-LCS002-1193

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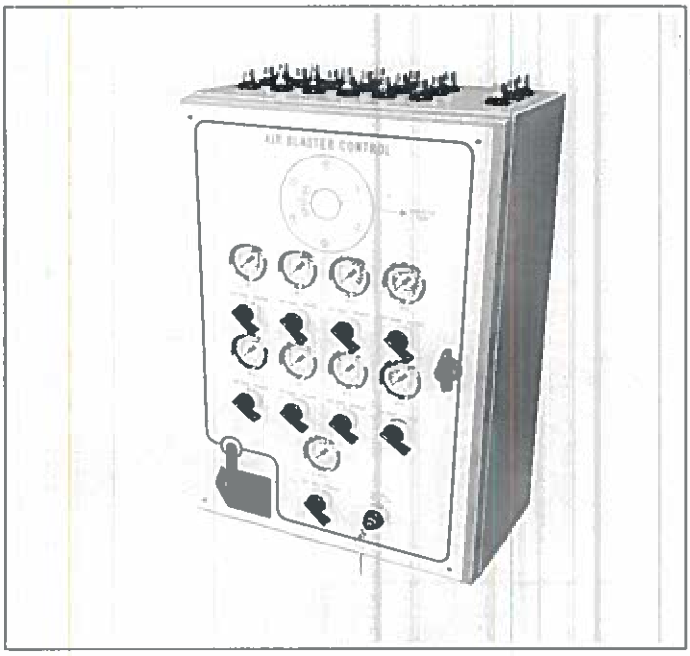
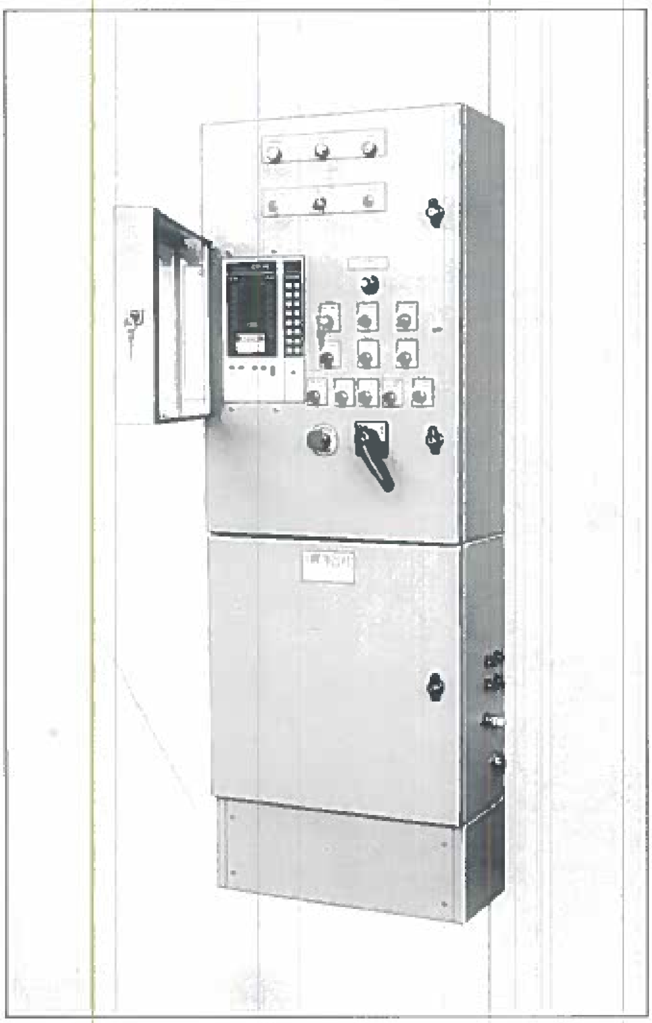
Pneumatic controls

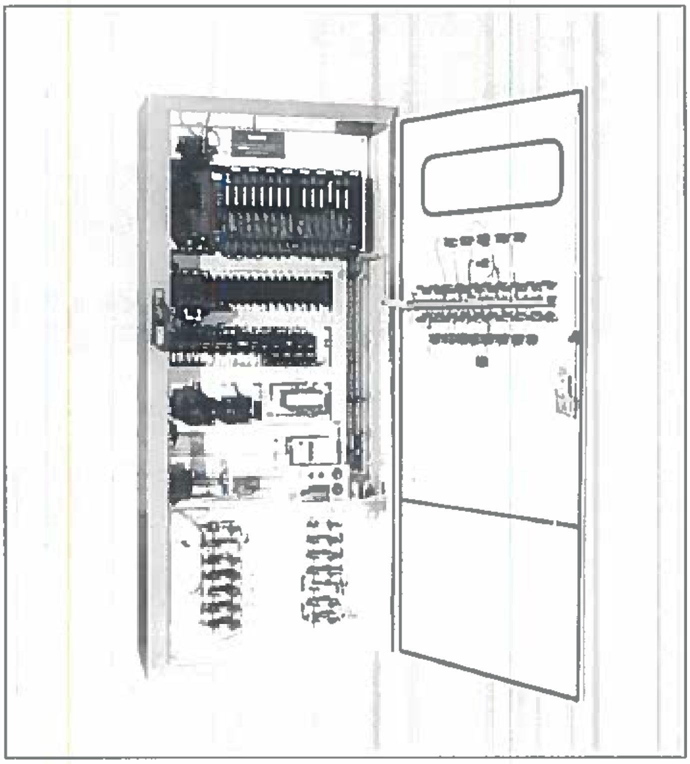
The Lang name is synonymous with quality and reliability. Lang features combined with Selex valve flexible manifold systems allows standardised valve mounting and ease of piping.
All pipework from cabinets terminate in bulkhead fittings giving neat appearance to the system. Push-in or compression fittings can be employed.



Electrical/electro-pneumatic controls

Generally any commercially available equipment can be fitted. Where there is no customer preference Lang Controls & Systems will use the best value for money equipment available to give a neat, compact package.





Service

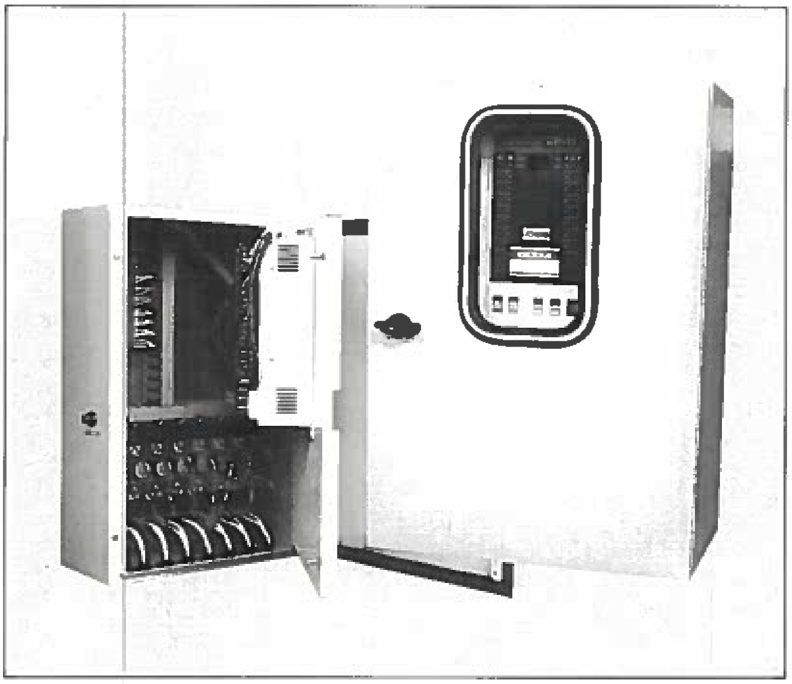
- This starts with any of our sales engineers or distributors offering advice at the earliest stage of the project.
- Systems offered after consultation with our design team.
- "On the job" help right through to final commissioning and testing of the complete system.
- Comprehensive after sales service available at all times.

No matter how large the system or small the requirement.

THE CHOICE IS - THE CUSTOMERS

Enclosures

In general a standard size enclosure will be used, sized as appropriate to the amount of equipment to be mounted within the system. Totally custom built enclosures in steel or stainless steel, can be supplied finished in any colour to customer's specification.



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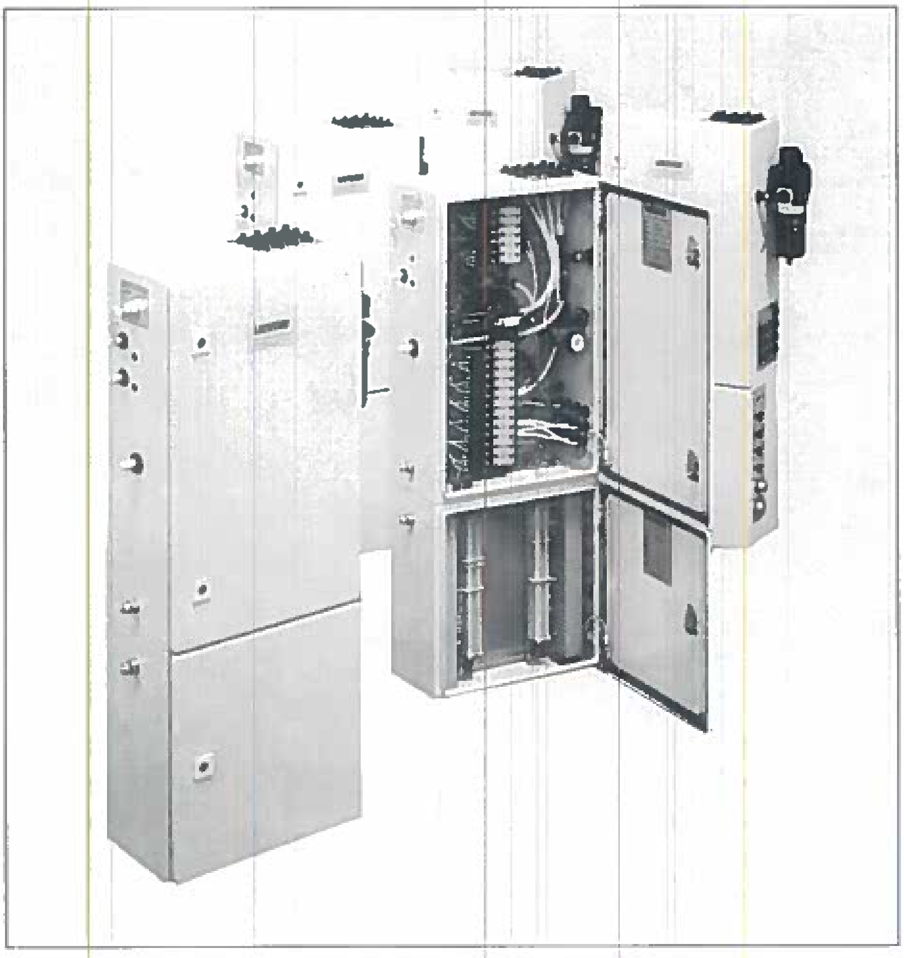
Pneumatics

LANG controls & systems

The flexible approach

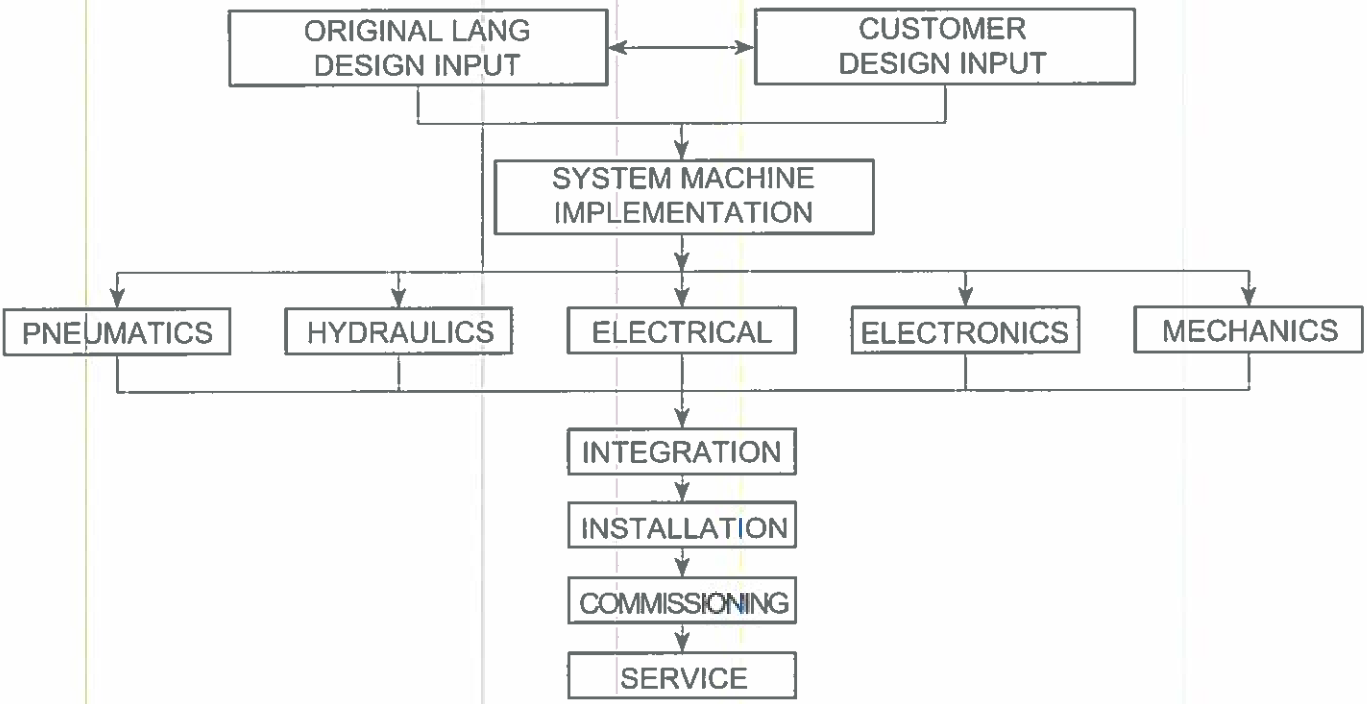


The total capability of Vickers Systems

The flexible approach allows Original Equipment Manufacturers and users alike to realise their requirements in system/machine control.

We will work with the customer in any or all stages of machine or system design. Utilising pneumatic, hydraulic, electrical and/or electronic control techniques in the implementation of machine control.

Although the control method can be of one discipline, it is more often the case that it is a mixture of several operating from simple relay logic to complete programmable logic controller systems controlling electrical, hydraulic or pneumatic equipment. The level of control can, depending on customer requirements, vary from a simple repetitive cycle to complex complete systems which may involve a number of controllers operating as individual units, but combining together to form an overall system and possibly being monitored and controlled from a central point.



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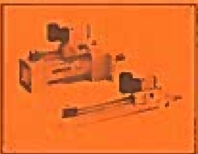
CERTIFICATE No. Q10706

CONTROL SYSTEMS and KIT SERVICE

SECTION 9

The Power in Automation

CONTROL SYSTEMS and KIT SERVICE

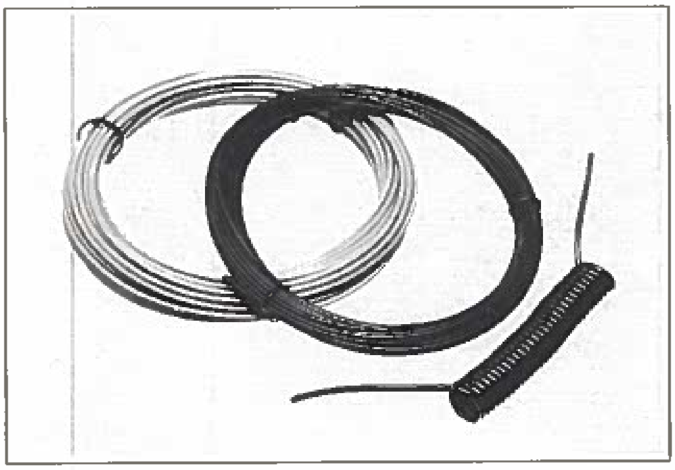
			Page numbers
Control panels and systems		Design and manufacture of complete control systems to customer specification	LSC 1.1 LCS 1.2 LCS 1.3
Valve / cylinder assemblies		Kit assemblies comprising any required combination of components	LCS 1.4
"One stop shop" KIT service		A "one line order" process for complete system requirements	LCS 1.4

The Power in Automation

VICKERS

Tube

Flexible nylon, Polyurethane, Polyurethane spring coil
4mm, 6mm, 8mm, 10mm, 12mm diameter



General description and application benefits

Ranges of flexible tubing suitable for general use with compression and push-in type fittings for low pressure hydraulic and pneumatic systems in 4mm, 6mm, 8mm, 10mm and 12mm o/dia.
Nylon tube to BS 5409/1:1976.
Polyurethane tube has excellent flex and bend capabilities over a wide temperature range and good resistance to abrasion.

- Extensive range
- Polyurethane extremely flexible
- Superior elasticity and coil memory

Model code

L A * * * - * * - * * - * *

1   2   3   4

[1] Tube material
141 = Flexible nylon
142 = Polyurethane

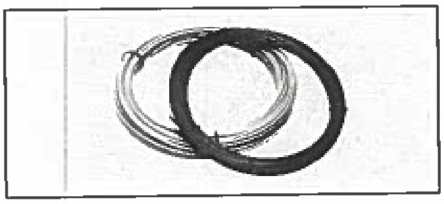
[2] Tube diameter
04 = 4mm o.d (2.5mm i.d.)
06 = 6mm o.d (4.0mm i.d.)
08 = 8mm o.d (6.0mm i.d.)
10 = 10mm o.d (7.5mm i.d.)
12 = 12mm o.d (9.0mm i.d.)

[3] Colour
00 = Natural
01 = Black
02 = Green
03 = Red
04 = Blue
05 = Yellow

[4] Working length (Spring coils only)
2M = 2 metres
3M = 3 metres
5M = 5 metres

Notes:- 1) All standard tube supplied in pre-packed coils of 30 metres length.
2) Spring coil standard - Black.
3) Polyurethane tube available in Natural, Black, Red and Blue only.

Preferred model selection - Flexible nylon



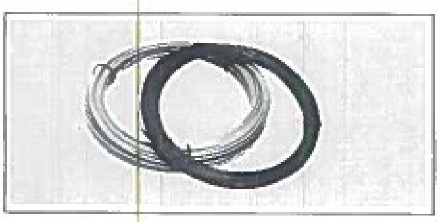
Model code	Description	Coil length
LA141-04-**	4mm flexible nylon	30 metres
LA141-06-**	6mm flexible nylon	30 metres
LA141-08-**	8mm flexible nylon	30 metres
LA141-10-**	10mm flexible nylon	30 metres
LA141-12-**	12mm flexible nylon	30 metres

*** = Colour:- 00 = Natural, 01 = Black, 02 = Green, 03 = Red, 04 = Blue, 05 = Yellow*

Specification - Flexible nylon

Material	Nylon 12	
Condition	Flexible	
Ambient operating temperature	-40° C to + 70° C (-40° F to 158° F)	
Tube bursting pressure at +20° C ambient temperature *Note:- Pressure ratings are temperature dependant*	4mm x 2.5mm - 110 bar (1595 psig) 8mm x 6mm - 70 bar (1015 psig) 12mm x 9mm - 70 bar (1015 psig)	6mm x 4mm - 100 bar (1450 psig) 10mm x 7.5mm - 72 bar (1044 psig)
Maximum service pressure at +20° C ambient temperature *Note:- Pressure ratings are temperature dependant*	4mm x 2.5mm - 28 bar (406 psig) 8mm x 6mm - 17 bar (246 psig) 12mm x 9mm - 17 bar (246 psig)	6mm x 4mm - 24 bar (348 psig) 10mm x 7.5mm - 18 bar (261 psig)
Minimum bend radius at +20° C ambient temperature 12mm o/d tube - 60mm	4mm o/d tube - 8mm 8mm o/d tube - 32mm	6mm o/d tube - 13mm 10mm o/d tube - 50mm
Tolerances (outside diameter)	4, 6, 8, 10 and 12mm tube - +0.05mm / -0.10mm	

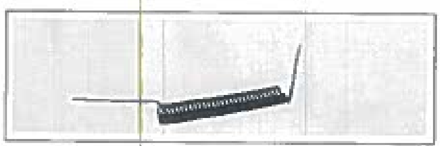
Preferred model selection - Polyurethane



Model code	Description	Coil length
LA142-04-**	4mm polyurethane	30 metres
LA142-06-**	6mm polyurethane	30 metres
LA142-08-**	8mm polyurethane	30 metres
LA142-10-**	10mm polyurethane	30 metres
LA142-12-**	12mm polyurethane	30 metres

*** = Colour:- 00 = Natural, 01 = Black, 03 = Red, 04 = Blue*

Preferred model selection - Polyurethane spring coil

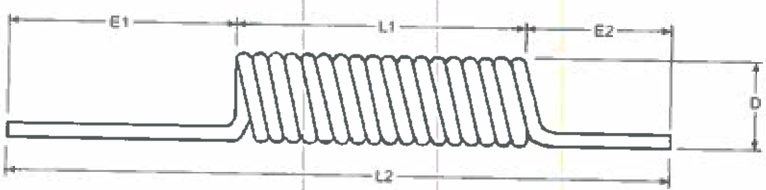


Model code	Description	Working length
LA142-04-01-2M	4mm polyurethane spring coil	2 metres
LA142-06-01-3M	6mm polyurethane spring coil	3 metres
LA142-08-01-5M	8mm polyurethane spring coil	5 metres

Specification - Polyurethane

Material	Polyurethane	
Condition	Flexible	
Ambient operating temperature	-50° C to + 55° C (-58° F to 131° F) - continuous use -50° C to + 85° C (-58° F to 185° F) - occasional short term use	
Tube bursting pressure at +20°C ambient temperature *Note:- Pressure ratings are temperature dependant*	4mm x 2.5mm - 51 bar (740 psig) 8mm x 6mm - 34 bar (500 psig) 12mm x 9mm - 34 bar (500 psig)	6mm x 4mm - 41 bar (600 psig) 10mm x 7.5mm - 34 bar (500 psig)
Maximum service pressure at +20°C ambient temperature *Note:- Pressure ratings are temperature dependant*	4mm x 2.5mm - 13 bar (185 psig) 8mm x 6mm - 8.6 bar (125 psig) 12mm x 9mm - 8.6 bar (125 psig)	6mm x 4mm - 10.3 bar (150 psig) 10mm x 7.5mm - 8.6 bar (125 psig)
Minimum bend radius at +20°C ambient temperature	4mm o/d tube - 6mm 8mm o/d tube - 23mm 12mm o/d tube - 40mm	6mm o/d tube - 11mm 10mm o/d tube - 25mm
Tolerances	4, 6 and 8mm tube - +0.1mm / - 0.1mm (outside diameter) 4, 6 and 8mm tube - +0.125mm / - 0.125mm (inside diameter) 10 and 12mm tube - +0.15mm / -0.15mm (outside diameter) 10 and 12mm tube - +0.2mm / -0.2mm (inside diameter)	

Installation dimensions in mm - Polyurethane spring coil



Part number	Tube o.d.	L1	L2	E1	E2	D
LA142-04-01-2M	4	130	310	90	90	25
LA142-06-01-3M	6	180	470	160	130	35
LA142-08-01-5M	8	340	640	160	140	50

Tube cutter

- Sharp cutting exactly at right angle
- Lightweight and compact
- Easy blade change
- Locking lever - closed position

Model code

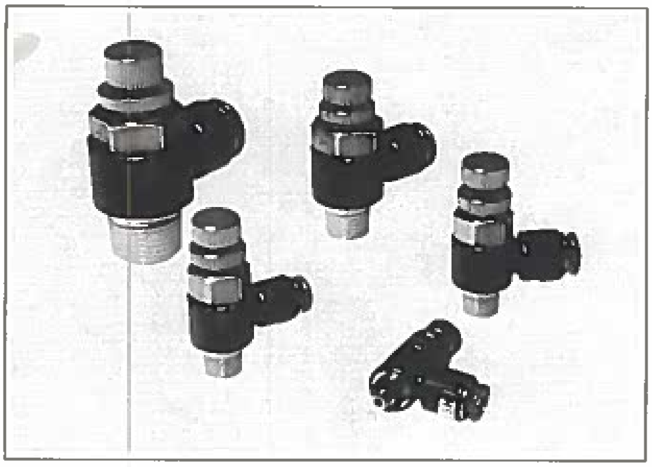
AZ - 1200

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF...
Tel: (01952) 586000 Fax: (01952) 586798

VICKERS

Banjo flow regulators

SC3G Series
M5, 1/8", 1/4", 3/8", 1/2"BSP



General description and application benefits

A range of unidirectional flow control regulators of banjo coupling design.

- Excellent flow characteristics
  - Large adjusting range and fine adjustment
- Use for controlling speed of cylinders
  - Free flow in, metered flow out
- Compact and lightweight
  - Enables greatly reduced piping space
- Safety mechanism
  - Needle not removable in fully open position
- Metal parts
  - Brass nickel plated

Model code

S C 3 G - * * - * *

[1] [2]

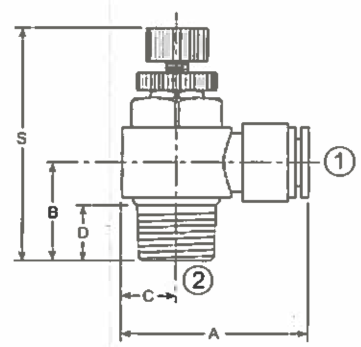
[1] **Supply connection** M5 = M5 x 0.8 thread, 6 = 1/8" thread, 8 = 1/4" thread, 10 = 3/8" thread, 15 = 1/2" thread

[2] **Inlet connection** *Note:- Inlet connection is of push-in type.* 4 = 4mm o/d tube, 6 = 6mm o/d tube, 8 = 8mm o/d tube, 10 = 10mm o/d tube, 12 = 12mm o/d tube

Preferred model selection and mass

Model code	Description	Mass
SC3G-M5-4	Banjo flow regulator M5 x 4mm o/d tube	0.010 kg
SC3G-M5-6	Banjo flow regulator M5 x 6mm o/d tube	0.011 kg
SC3G-6-4	Banjo flow regulator 1/8" BSP taper x 4mm o/d tube	0.025 kg
SC3G-6-6	Banjo flow regulator 1/8" BSP taper x 6mm o/d tube	0.026 kg
SC3G-6-8	Banjo flow regulator 1/8" BSP taper x 8mm o/d tube	0.027 kg
SC3G-8-6	Banjo flow regulator 1/4" BSP taper x 6mm o/d tube	0.050 kg
SC3G-8-8	Banjo flow regulator 1/4" BSP taper x 8mm o/d tube	0.051 kg
SC3G-8-10	Banjo flow regulator 1/4" BSP taper x 10mm o/d tube	0.054 kg
SC3G-10-8	Banjo flow regulator 3/8" BSP taper x 8mm o/d tube	0.076 kg
SC3G-10-10	Banjo flow regulator 3/8" BSP taper x 10mm o/d tube	0.081 kg
SC3G-10-12	Banjo flow regulator 3/8" BSP taper x 12mm o/d tube	0.088 kg
SC3G-15-12	Banjo flow regulator 1/2" BSP taper x 12mm o/d tube	0.138 kg

Installation dimensions in mm

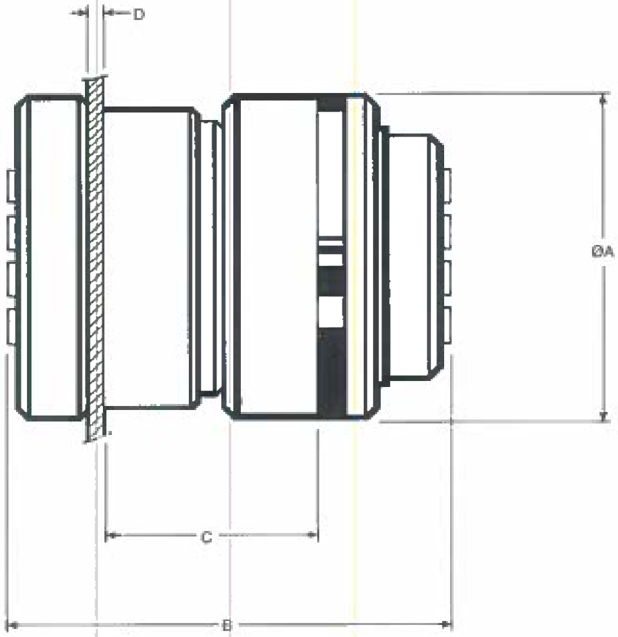


Part number	Port ① Tube o/d	Port ② M or R	A	B	C	D	S (max)
SC3G-M5-4	4	M5	28.2	13	5.2	4	33.4
SC3G-M5-6	6	M5	28.2	12.3	5.2	4	33.4
SC3G-6-4	4	1/8"	32.5	20.4	7.5	8	42.7
SC3G-6-6	6	1/8"	32.5	20.4	7.5	8	42.7
SC3G-6-8	8	1/8"	34	19.5	7.5	8	42.7
SC3G-8-6	6	1/4"	36.7	24.9	9.5	11	51.2
SC3G-8-8	8	1/4"	38	24.9	9.5	11	51.2
SC3G-8-10	10	1/4"	41.5	23.9	9.5	11	51.2
SC3G-10-8	8	3/8"	41.6	29.8	11.3	12	60.2
SC3G-10-10	10	3/8"	45.1	30	11.3	12	60.2
SC3G-10-12	12	3/8"	49.1	29.3	11.3	12	60.2
SC3G-15-12	12	1/2"	53.5	33.8	13.5	15	66.7

Operating data

Operating pressure	Primary vacuum to 17 bar (250 psig)
Ambient operating temperature	+5º C to + 40º C (41º F to 104º F)
Materials of constuction	Body - PVC Seals - Nitrile Internal parts - Stainless steel and acetal Tube connectors -Instant push-in fittings
Operating medium	Compressed air and compatible gases
Applicable tube	Semi rigid nylon, Flexible nylon, Polyurethane
Service kits	Not applicable - replace unit

Installation dimensions in mm



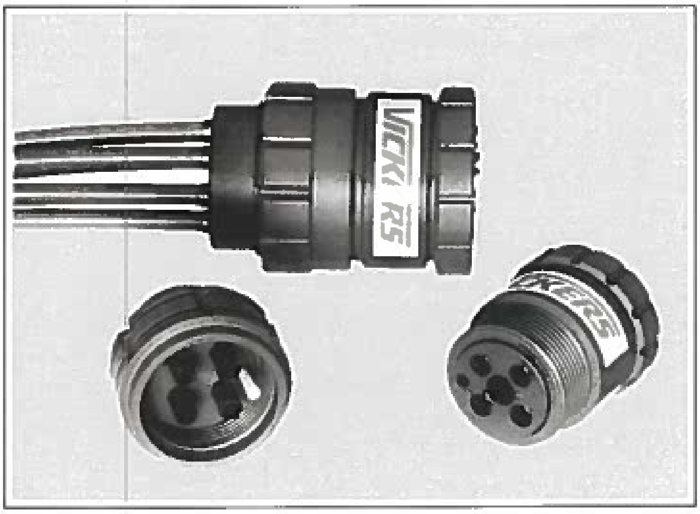
Part number	Body Size	A	B	C	D	Panel Hole Ø
LA2-04-06-G	50	55	92	43	1 to 8mm	44
LA2-04-12-G	70	75	96	47	1 to 8mm	64
LA2-06-06-G	70	75	96	47	1 to 8mm	64
LA2-06-12-G	100	105	115	55	1 to 8mm	85
LA2-08-06-G	70	75	96	47	1 to 8mm	64
LA2-08-12-G	100	105	115	55	1 to 8mm	85

Note:- Dimension "C" = Projection of socket half from panel face

Special note

Units available in both metric and imperial tube sizes from 2 way to 18 way also with mixed sizes of tube. Also available in other materials to special order.

Multi - tube connectors



General description and application benefits

The LA2 series of multi-tube connectors are a unique way of simultaneously connecting tube systems together with the added feature of automatic line shut-off on disconnection. Installation is fast and compact with the added benefit that connections can be de-coupled at any time without pressure loss or the risk of cross matching lines.

- Quick connect / disconnect
  - < 10 secs for up to 18 lines simultaneously
- Integral shut off valves
  - closes all supplies automatically on disconnection
- Space saving
  - up to 18 lines in a coupling
- Cost effective
  - installation and assembly time reduced
- Built in locator for self alignment
  - foolproof connection, prevent cross matching lines

Model code

LA2 - * * - * * - G - *

1 (* *), 2 (* *), 3 (*)

1 Tube o.d.
04 = 4mm
06 = 6mm
08 = 8mm

2 Number of tube connections

3 Special instructions
i.e Mixed tube sizes

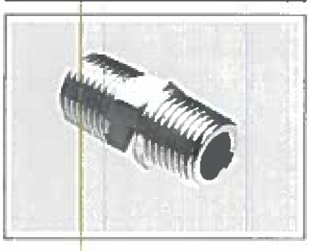
Preferred model selection and mass

Model code	Description	Mass
LA2-04-06-G	4mm x 6 way	0.288 kg
LA2-04-12-G	4mm x 12 way	0.570 kg
LA2-06-06-G	6mm x 6 way	0.494 kg
LA2-06-12-G	6mm x 12 way	1.750 kg
LA2-08-06-G	8mm x 6 way	0.504 kg
LA2-08-12-G	8mm x 12 way	1.780 kg

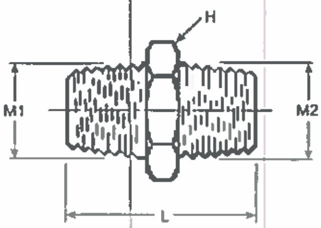
Related fittings

Male to male adaptor

Series **LA121**



Part numbers and installation dimensions in mm

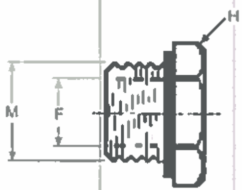


Part number.	M1 M or R	M2 M or R	L	H A/F
FNS-M5	M5	M5	9.5	7
LA121-10-10	1/8"	1/8"	19	11
LA121-13-13	1/4"	1/4"	27	14
LA121-17-17	3/8"	3/8"	28	17
LA121-21-21	1/2"	1/2"	36	22
LA121-27-27	3/4"	3/4"	40	27
LA121-34-34	1"	1"	46	36

Male to female reducer

Series **LA168**

Part numbers and installation dimensions in mm



Part number.	Male thread M R or G	Female thread F M or G	H A/F
LA163-10-19	R1/8"	M5	14
LA168-10-19	1/8"	M5	14
LA168-13-10	1/4"	1/8"	17
LA168-17-13	3/8"	1/4"	19
LA168-21-10	1/2"	1/8"	24
LA168-21-13	1/2"	1/4"	24
LA168-21-17	1/2"	3/8"	24
LA168-27-13	3/4"	1/4"	32
LA168-27-21	3/4"	1/2"	32
LA168-34-27	1"	3/4"	41

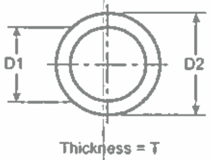
*Copper washer to be ordered separately - See part number LA138-**-** below.*

Copper washers

Series **LA138**

*For use with male to female reducer part number LA168-**-** above*

Part numbers and installation dimensions in mm

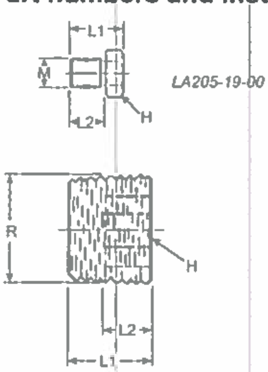


Part number.	For male thread G	D1	D2	T
LA138-10-00	1/8"	10.3	13.5	1
LA138-13-00	1/4"	13.4	18.3	1.5
LA138-17-00	3/8"	17.2	23.5	1.5
LA138-21-00	1/2"	21	27.8	1.5
LA138-27-00	3/4"	27.3	32	2
LA138-34-00	1"	33.3	39	2

Screwed plug

Series **LA205**

Part numbers and installation dimensions in mm



Part number.	Thread M M or R	L1	L2	H A/F
LA205-19-00	M5	8	5	5
LA205-10-00	1/8"	8	6	5
LA205-13-00	1/4"	10	8	6
LA205-17-00	3/8"	11	8	8
LA205-21-00	1/2"	13	8	10
LA205-27-00	3/4"	17	11	14
LA205-34-00	1"	19	13	17

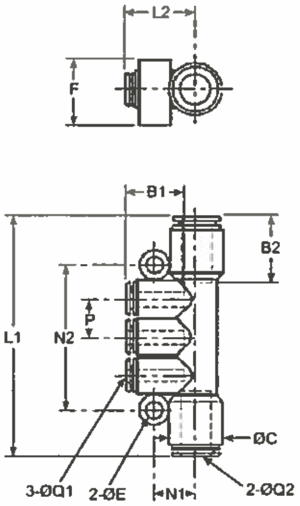
VICKERS

Pneumatics

Block manifold - single

Series **ZM**

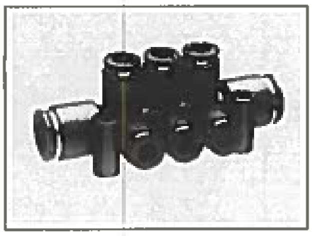
Part numbers and installation dimensions in mm



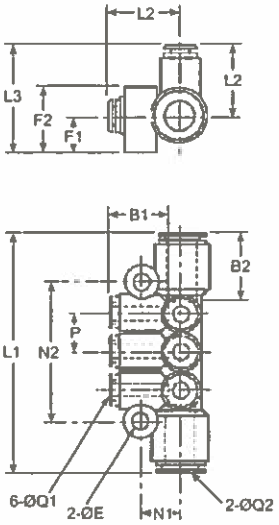
Part number.	Connecting tube o.d. Q1	Q2	L1	L2	B1	B2	C	E	F	N1	N2	P
ZM-0406	4	6	64	18.5	16	17.5	12.5	4.5	13.5	10.5	39	10.5
ZM-0408	4	8	66	19.5	16	19	14.5	4.5	15.5	11.5	39	10.5
ZM-0608	6	8	73	21	17.5	19	14.5	4.5	15.5	11.5	46.5	13
ZM-0610	6	10	78.5	22	17.5	21.5	17.5	4.5	18.5	13	46.5	13
ZM-0810	8	10	84.5	23.5	19	21.5	17.5	4.5	18.5	13	52.5	15

Block manifold - double

Series **ZBM**



Part numbers and installation dimensions in mm

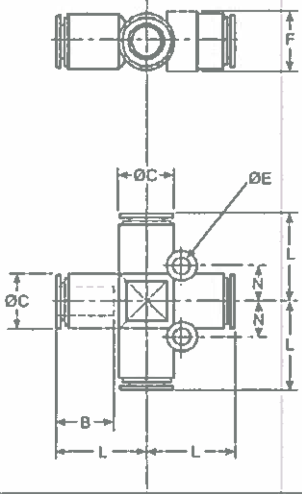


Part number.	Connecting tube o.d. Q1	Q2	L1	L2	L3	B1	B2	E	F1	F2	N1	N2	P
ZBM-0408	4	8	66	19.5	29.5	16	19	4.5	10	17.5	10.5	38	10.5
ZBM-0610	6	10	78.5	22	32	17.5	21.5	4.5	10	19.5	12	45	13
ZBM-0812	8	12	87	24.5	36	19	23	4.5	11.5	22	13	51	15

Equal ended cross

Series **ZCR**

Part numbers and installation dimensions in mm

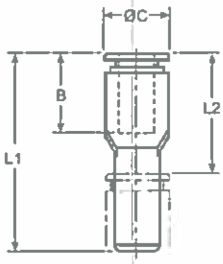


Part number	Tube o.d.	L	B	C	E	F	N	Min ø orifice
ZCR-08	8	24	19	14.5	4.2	15.5	9.5	6
ZCR-10	10	27.5	21.5	17.5	4.2	18.5	11	8
ZCR-12	12	30	23	20	4.2	21	12	10

Reducer / enlarger

Series **ZR**

Part numbers and installation dimensions in mm

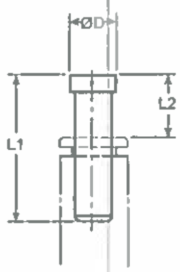


Part number	Tube o.d.	Connecting joint ø	L1	L2	B	C	Min ø orifice
ZR-0406	4	6	38.5	21	16	10	2.3
ZR-0604	6	4	42	26	17.5	12.5	2.3
ZR-0608	6	8	41	22	17.5	12.5	4
ZR-0610	6	10	42	20	17.5	12.5	4
ZR-0810	8	10	44.5	22.5	19	14.5	6
ZR-0812	8	12	44	21	19	14.5	6
ZR-1012	10	12	48	25	21.5	17.5	8

Blanking plug

Series **SLM-BV**

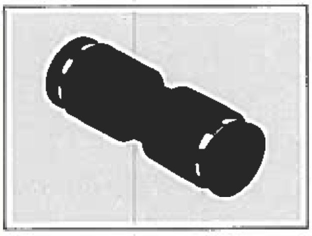
Part numbers and installation dimensions in mm



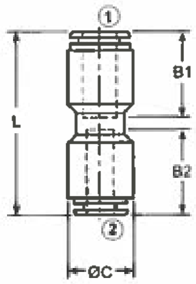
Part number	Connecting joint ø	L1	L2	D
SLM-04BV	4	27	9	6
SLM-06BV	6	29	11	8
SLM-08BV	8	33	13.5	10
SLM-10BV	10	40	17	12
SLM-12BV	12	43	16	14

Straight connector

Series ZS



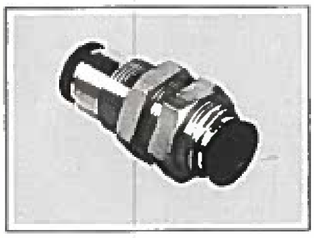
Part numbers and installation dimensions in mm



Part number	Tube o.d. ①	Tube o.d. ②	L	B1	B2	C	Min ø orifice
ZS-040	4	4	33.5	16	16	10	2.5
ZS-0604	6	4	36.5	17.5	16	12.5	4
ZS-060	6	6	36.5	17.5	17.5	12.5	4
ZS-0806	8	6	39.5	19.5	17	14.5	4
ZS-080	8	8	39.5	19	19	14.5	6
ZS-1008	10	8	45	21.5	19	17.5	6
ZS-100	10	10	45	21.5	21.5	17.5	8
ZS-1210	12	10	47.5	23	21.5	20	8
ZS-120	12	12	47.5	23	23	20	10

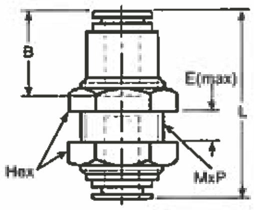
Bulkhead connector

Series ZX



Connections:-
Push-in to push-in

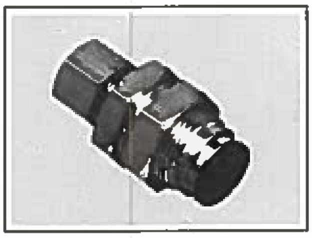
Part numbers and installation dimensions in mm



Part number	Tube o.d.	Hex	L	B	E	MxP	Panel hole ø	Min ø orifice
ZX-040	4	14	33	16	7.5	M12x1	13	2.5
ZX-060	6	17	36	17.5	9.5	M14x1	15	4
ZX-080	8	19	39	19	12.5	M16x1	17	6
ZX-100	10	23	44.5	21.5	18	M20x1	21	8
ZX-120	12	26	47	23	20.5	M22x1	23	9

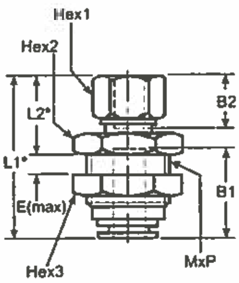
Bulkhead connector

Series ZK



Connections:-
Push-in to compression

Part numbers and installation dimensions in mm



Part number	Tube o.d.	Hex1	Hex2	Hex3	L1	L2	B1	B2
ZK-0404	4	10	14	14	29.5	15	16	11
ZK-0606	6	12	17	17	33	16	17.5	11.5
ZK-0808	8	14	19	19	35	17.5	19	13
ZK-1010	10	17	22	23	40	19.5	21.5	14.5
ZK-1212	12	19	24	26	43.5	21	23	16

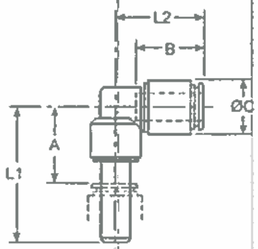
E	MxP	Panel hole ø	Min ø orifice
5	M12x1	13	2.5
5	M14x1	15	4
6	M16x1	17	6
9	M20x1	21	8
10	M22x1	23	9

Note: '' shows dimensions prior to tightening nut (Hex1)*

Stem elbow adaptor

Series **ZL-P**

Part numbers and installation dimensions in mm

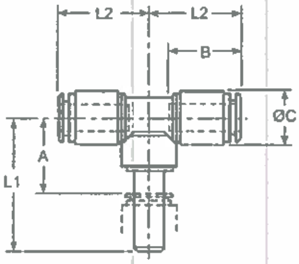


Part number	Tube o.d.	Connecting joint ø	L1	L2	A	B	C	Min ø orifice
ZL-0404P	4	4	30	18.5	14	16	10	1.7
ZL-0406P	4	6	31	18.5	13.5	16	10	1.7
ZL-0408P	4	8	32.5	18.5	13.5	16	10	1.7
ZL-0606P	6	6	34	21	16.5	17.5	12.5	3.4
ZL-0608P	6	8	35.5	21	16.5	17.5	12.5	3.4
ZL-0610P	6	10	38	21	16.5	17.5	12.5	3.4
ZL-0808P	8	8	36.5	23.5	17.5	19	14.5	5.4
ZL-0810P	8	10	39	23.5	17.5	19	14.5	5.4
ZL-0812P	8	12	40	23.5	17	19	14.5	5.4
ZL-1010P	10	10	41.5	27	20	21.5	17.5	6.8
ZL-1012P	10	12	42.5	27	19.5	21.5	17.5	6.8
ZL-1212P	12	12	44.5	29.5	21.5	23	20	8.8

Stem tee adaptor

Series **ZC-P**

Part numbers and installation dimensions in mm

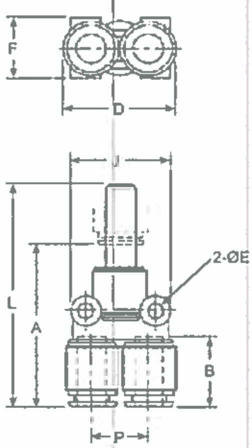


Part number	Tube o.d.	Connecting joint ø	L1	L2	A	B	C	Min ø orifice
ZC-0404P	4	4	30	18.5	14	16	10	1.7
ZC-0406P	4	6	31	18.5	13.5	16	10	1.7
ZC-0408P	4	8	32.5	18.5	14.5	16	10	1.7
ZC-0606P	6	6	34	21	16.5	17.5	12.5	3.4
ZC-0608P	6	8	35.5	21	16.5	17.5	12.5	3.4
ZC-0610P	6	10	38	21	16.5	17.5	12.5	3.4
ZC-0808P	8	8	36.5	23.5	17.5	19	14.5	5.4
ZC-0810P	8	10	39	23.5	17.5	19	14.5	5.4
ZC-0812P	8	12	40	23.5	17	19	14.5	5.4
ZC-1010P	10	10	41.5	27	20	21.5	17.5	6.8
ZC-1012P	10	12	42.5	27	19.5	21.5	17.5	6.8
ZC-1212P	12	12	44.5	29.5	21.5	23	20	8.8

Stem Y type adaptor

Series **ZY-P**

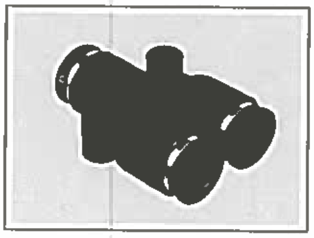
Part numbers and installation dimensions in mm



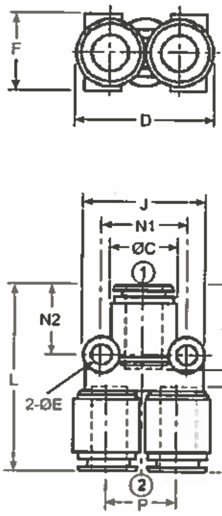
Part number	Tube o.d.	Connecting joint ø	L	A	B	D	E	F	J	P	Min ø orifice
ZY-0404P	4	4	51.5	35.5	16	21	4.2	11	23	11	1.7
ZY-0406P	4	6	52.5	35	16	21	4.2	11	23	11	2.5
ZY-0408P	4	8	54	35	16	21	4.2	11	23	11	2.5
ZY-0606P	6	6	55.5	38	17.5	26	4.2	13.5	25.5	13.5	3.9
ZY-0608P	6	8	57	38	17.5	26	4.2	13.5	25.5	13.5	4
ZY-0610P	6	10	59.5	38	17.5	26	4.2	13.5	25.5	13.5	4
ZY-0808P	8	8	60	41	19	30	4.2	15.5	27	15.5	5.9
ZY-0810P	8	10	62.5	41	19	30	4.2	15.5	27	15.5	6
ZY-0812P	8	12	63.5	40	19	30	4.2	15.5	27	15.5	6
ZY-1010P	10	10	70	48.5	21.5	36	4.2	18.5	30	18.5	6.8
ZY-1012P	10	12	71	48	21.5	36	4.2	18.5	30	18.5	6.8
ZY-1212P	12	12	76	53	23	41	4.2	21	32	21	8.8

Straight connector - Y type

Series ZY



Part numbers and installation dimensions in mm

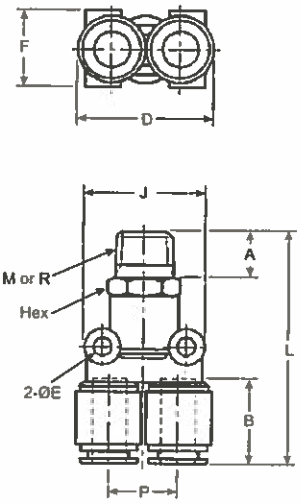


Part number	Tube o.d. ①	Tube o.d. ②	L	B1	B2	C	D	E	F	J	N1	N2	P
ZY-0404	4	4	34.5	16	16	10	21	4.2	11	23	15	12.5	11
ZY-0604	6	4	37.5	17.5	16	12.5	26	4.2	13.5	25.5	17.5	14	13.5
ZY-0606	6	6	37.5	17.5	17.5	12.5	26	4.2	13.5	25.5	17.5	14	13.5
ZY-0806	8	6	40.5	19	17.5	14.5	30	4.2	15.5	27	19	15	15.5
ZY-0808	8	8	40.5	19	19	14.5	30	4.2	15.5	27	19	15	15.5
ZY-1008	10	8	48	21.5	19	17.5	36	4.2	18.5	30	22	18	18.5
ZY-1010	10	10	48	21.5	21.5	17.5	36	4.2	18.5	30	22	18	18.5
ZY-1210	12	10	53	23	22	20	41	4.2	21	32	24	19.5	21
ZY-1212	12	12	53	23	23	20	41	4.2	21	32	24	19.5	21

Straight connector - Y type (threaded)

Series ZY-N

Part numbers and installation dimensions in mm

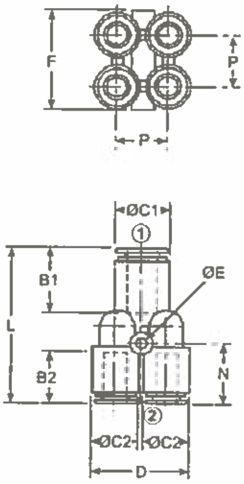


Part number	Tube o.d.	Thread M or R	Hex	L	A	B	D	E	F	J	P
ZY-045MN	4	M5x0.8	12	38	4	16	21	4.2	11	23	11
ZY-041N	4	1/8"	12	42	8	16	21	4.2	11	23	11
ZY-042N	4	1/4"	14	45.5	11	16	21	4.2	11	23	11
ZY-065MN	6	M5x0.8	14	41	4	17.5	26	4.2	13.5	25.5	13.5
ZY-061N	6	1/8"	14	46	8	17.5	26	4.2	13.5	25.5	13.5
ZY-062N	6	1/4"	14	49	11	17.5	26	4.2	13.5	25.5	13.5
ZY-063N	6	3/8"	14	50.5	12	17.5	26	4.2	13.5	25.5	13.5
ZY-081N	8	1/8"	17	49	8	19	30	4.2	15.5	27	15.5
ZY-082N	8	1/4"	17	52	11	19	30	4.2	15.5	27	15.5
ZY-083N	8	3/8"	17	53.5	12	19	30	4.2	15.5	27	15.5
ZY-102N	10	1/4"	19	59.5	11	21.5	36	4.2	18.5	30	18.5
ZY-103N	10	3/8"	19	61	12	21.5	36	4.2	18.5	30	18.5
ZY-104N	10	1/2"	22	64	15	21.5	36	4.2	18.5	30	18.5
ZY-122N	12	1/4"	22	64.5	11	23	41	4.2	21	32	21
ZY-123N	12	3/8"	22	66	12	23	41	4.2	21	32	21
ZY-124N	12	1/2"	22	69	15	23	41	4.2	21	32	21

Double Y type connector

Series ZWY

Part numbers and installation dimensions in mm

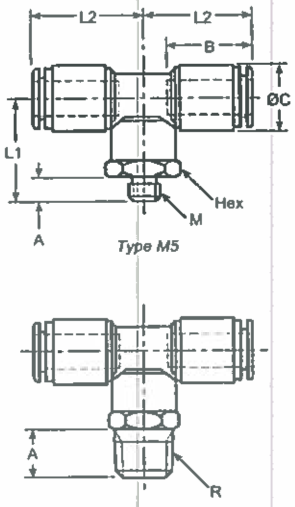


Part number	Tube o.d. ①	Tube o.d. ②	L	B1	B2	C1	C2	D	E	F	N	P
ZWY-0604	6	4	39	17.5	16	12.5	10	21	3.2	22	15.5	11
ZWY-0806	8	6	43	19	17.5	14.5	12.5	26	3.2	27	17	13.5

Swivel tee adaptor

Series **ZC**

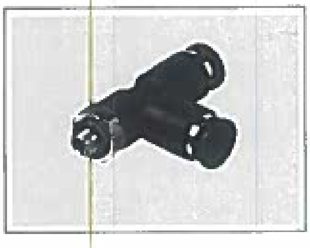
Part numbers and installation dimensions in mm



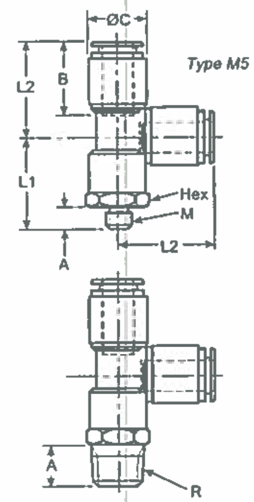
Part number	Tube o.d.	Thread R	Hex	L1	L2	A	B	C	Min ø orifice
ZC-045M	4	M5x0.8	10	16.5	18.5	4	16	10	2.5
ZC-041	4	1/8"	10	20.5	18.5	8	16	10	2.5
ZC-042	4	1/4"	14	24	18.5	11	16	10	2.5
ZC-065M	6	M5x0.8	12	20	21	4	17.5	12.5	2.5
ZC-061	6	1/8"	12	24	21	8	17.5	12.5	4
ZC-062	6	1/4"	14	27.5	21	11	17.5	12.5	4
ZC-063	6	3/8"	17	29	21	12	17.5	12.5	4
ZC-081	8	1/8"	14	25.5	23.5	8	19	14.5	6
ZC-082	8	1/4"	14	28.5	23.5	11	19	14.5	6
ZC-083	8	3/8"	17	30	23.5	12	19	14.5	6
ZC-102	10	1/4"	17	31	27	11	21.5	17.5	8
ZC-103	10	3/8"	17	32.5	27	12	21.5	17.5	8
ZC-104	10	1/2"	22	35.5	27	15	21.5	17.5	8
ZC-122	12	1/4"	19	33	29.5	11	23	20	8.5
ZC-123	12	3/8"	19	34.5	29.5	12	23	20	8.5
ZC-124	12	1/2"	22	37.5	29.5	15	23	20	8.5

Swivel side tee adaptor

Series **ZD**



Part numbers and installation dimensions in mm

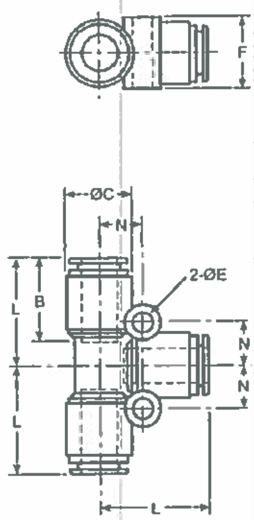


Part number	Tube o.d.	Thread M or R	Hex	L1	L2	A	B	C	Min ø orifice
ZD-045M	4	M5x0.8	10	16.5	18.5	4	16	10	2.5
ZD-041	4	1/8"	10	20.5	18.5	8	16	10	2.5
ZD-042	4	1/4"	14	24	18.5	11	16	10	2.5
ZD-065M	6	M5x0.8	12	19.5	21	4	17.5	12.5	2.5
ZD-061	6	1/8"	12	24	21	8	17.5	12.5	4
ZD-062	6	1/4"	14	27.5	21	11	17.5	12.5	4
ZD-063	6	3/8"	17	29	21	12	17.5	12.5	4
ZD-081	8	1/8"	14	25.5	23.5	8	19	14.5	6
ZD-082	8	1/4"	14	28.5	23.5	11	19	14.5	6
ZD-083	8	3/8"	17	30	23.5	12	19	14.5	6
ZD-102	10	1/4"	17	31	27	11	21.5	17.5	8
ZD-103	10	3/8"	17	32.5	27	12	21.5	17.5	8
ZD-104	10	1/2"	22	35.5	27	15	21.5	17.5	8
ZD-122	12	1/4"	19	33	29.5	11	23	19.5	8.5
ZD-123	12	3/8"	19	34.5	29.5	12	23	19.5	8.5
ZD-124	12	1/2"	22	37.5	29.5	15	23	19.5	8.5

Tee connector

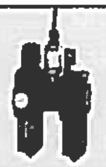
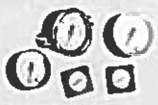
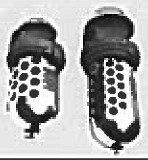
Series **ZT**

Part numbers and installation dimensions in mm



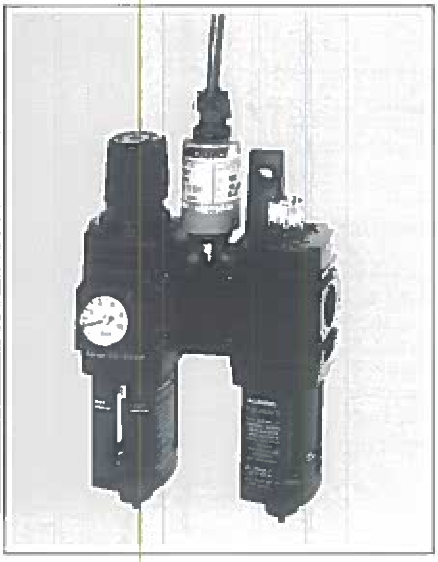
Part number	Tube o.d.	L	B	C	E	F	N	Min ø orifice
ZT-040	4	18.5	16	10	4.2	11	7.5	2.5
ZT-060	6	21	17.5	12.5	4.2	13.5	8.5	4
ZT-080	8	23.5	19	14.5	4.2	15.5	9.5	6
ZT-100	10	27	21.5	17.5	4.2	18.5	11	8
ZT-120	12	29.5	23	20	4.2	21	12	10

Associated products

Product	Port size	Model code	Description	Maximum flow	Page numbers
Pressure switch 	G1/8"	PS013-8	8 bar switch		PS08 1.1
	G1/8"	PS013-5	5 bar switch		
	G1/8"	PS013-3	3 bar switch		
Exhaust cleaner	G3/8"	FA331-10G	Ex cleaner	5.0 dm³/sec	FA 1.1 FA 1.2
	G1/2"	FA431-15G	Ex cleaner	10.0 dm³/sec	
	G3/4"	FA531-20G	Ex cleaner	16.7 dm³/sec	
	G1"	FA631-25G	Ex cleaner	50.0 dm³/sec	
	G1½"	FA731-40G	Ex cleaner	100.0 dm³/sec	
	G2"	FA831-50G	Ex cleaner	166.7 dm³/sec	
Pressure gauges 		GRP-96-722	Flush mounted		PG 1.1
		GRP-96-723	Flush mounted		
	R1/8"	MF1415-4	Back mounted		
	R1/8"	MF1415-10	Back mounted		
	R1/4"	F2615-4	Back mounted		
	R1/4"	F2615-10	Back mounted		
	R1/8"	SG2-10	Panel mounted		
Exhaust muffler / reclassifiers 	G1/2"	F23-C4-000	Ex muffler	80.0 dm³/sec	MR 1.1
	G1"	F33-C4-000	Ex muffler	135.0 dm³/sec	
Automatic drains	G1/2"	X02-C4-F00	Auto drain	300 litres/hr (drain rate)	X 1.1
	G1/2"	X01-C4-000	Auto drain	570 litres/hr (drain rate)	

Pressure switch

PS013 Series
1/8"BSP



1. General description and application benefits

Pressure switches are used for monitoring system pressures to sound an alarm, operate a warning light, or cut off the electrical supply to a pump or machine as soon as the pressure gets above or below the optimum level.

PS013 pressure switches are particularly suitable for use on 08 series regulators, filter/regulators or FRL units. Switch is installed immediately downstream of the regulator unit by fitting to a distributor block (Part number LN08-C2-0000 or LN08-C2-C000).

- Small and compact.
- Factory set or field adjustment.
- Spring diaphragm.
- Ranges from 3 to 8 bar.
- Rated at 5 amps at 250v AC.
- Burst pressure 100 bar.

2. Functional symbol

3. Preferred model selection

PS013-8	8 bar pressure switch with 3 metre flying lead (standard)
PS013-5	5 bar pressure switch with 3 metre flying lead (optional)
PS013-3	3 bar pressure switch with 3 metre flying lead (optional)

4. Operating data

Operating pressure	PS013-8 1.0 - 8 bar (14.5 - 116psig) PS013-5 0.5 - 5 bar (7.3 - 72.5 psig) PS013-3 0.3 - 3 bar (4.3 - 43.5 psig)
Maximum pressure Static applications - Full range	Cyclic applications - 75% of range
Setting pressure	All switches are adjustable and are supplied set at mid range
Pressure differential	PS013-8 0.75 bar (10.9 psig) PS013-5 0.27 bar (4.0 psig) PS013-3 0.15 bar (2.2 psig)
Ambient operating temperature range	-10° C to + 80° C (14°F to + 176° F)
Type of connection	Screwthread
Thread size	1/8" BSP
Materials of construction	Case - Delrin Diaphragm - Beryllium copper Seals - Nitrile
Operating medium	Vacuum, compressed air, water oil, non-corrosive fluids
Type of electrical connection	3 metre 3 core flying lead Brown-Common, Black-Normally open Blue-Normally closed
Contact rating	5 amps at 250v AC For use on DC circuits or with electronic control equipment consult Customer Services Department
Microswitch	Single pole, single throw microswitch. Can be wired normally open or normally closed.
Corrosive applications	The threaded connection can be 316 stainless steel or UPVC. The diaphragm can be protected from corrosion by fitting a thin disc of PTFE (Such switches should not be used on vacuum applications). PTFE, Viton or EPDM seals available as option. For additional details consult Customer Services Department.
Installation dimensions GB-P5005-PS013-0393	See page PS 2.2 on leaflet
Mass	PS013-* 0.100kg (0.22lb)
Service kits	Replace unit

CKD exhaust cleaner

FA Series
3/8", 1/2", 3/4", 1", 1$^1/_2$", 2" BSP

1. General description and application benefits

The FA Series exhaust cleaners effectively remove the dust, oil mist etc. from compressed air exhausted from pneumatic equipment such as solenoid valves and cylinders whilst decreasing the exhaust noise thereby improving the working environment.

- Sound arresting efficiency 35dB or more.
- Oil mist collection ratio 99.9% and over.
- Capacity range 300Nl/min to 10000Nl/min.
- Drain cock permits easy discharge.
- Cleaner can be used in re-cycle lube situation.
- Mounting brackets for FA331 to FA631 models (Order separately).

2. Preferred model selection

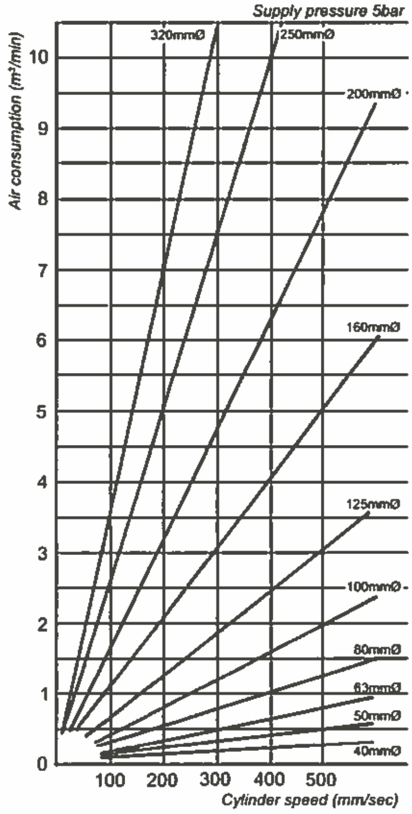
FA331-10G	Exhaust cleaner G3/8"
FA431-15G	Exhaust cleaner G1/2"
FA531-20G	Exhaust cleaner G3/4"
FA631-25G	Exhaust cleaner G1"
FA731-40G	Exhaust cleaner G1$^1/_2$"
FA831-50G	Exhaust cleaner G2"

Select the model according to the amount of air consumed by the circuit.
1) Calculate the amount of air consumed by the cylinders.
2) Multiply the air consumption value by 1.4.
3) Select the model having a treatment capacity exceeding this value.

The graph on the right gives air consumption values (multiplied by 1.4) for cylinders of 40 to 320mm bore.

Mounting Brackets

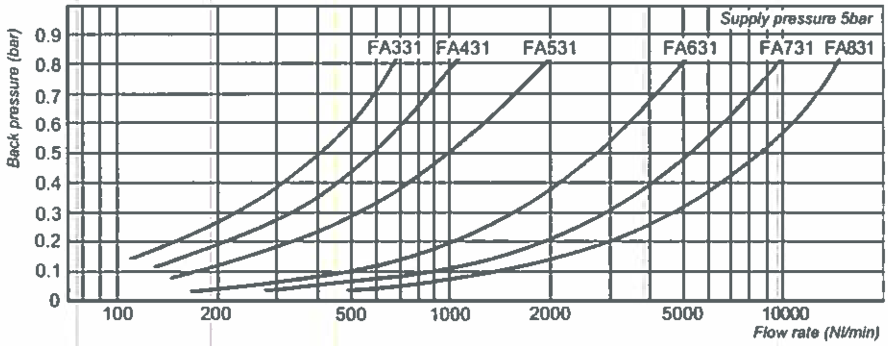
Model number	Bracket number
FA331-10G	B351-10A
FA431-15G	B451-15A
FA531-20G	B551-20A
FA631-25G	B651-25A



3. Operating data

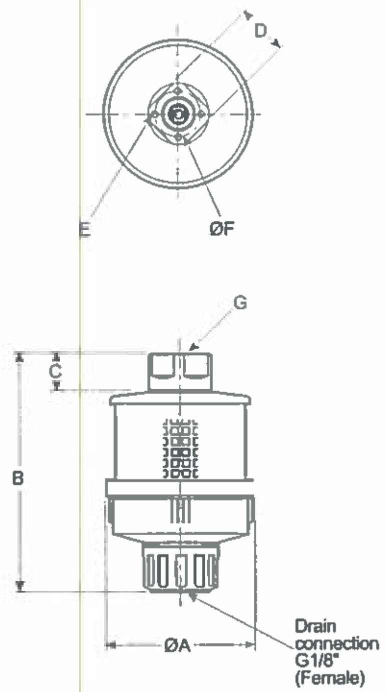
Maximum operating temperature	65° C (149° F)	
Sound arresting efficiency	35dB and over	
Oil mist collection efficiency	99.9% and over	
Effective sectional area	FA331 - 16mm^2 FA431 - 33mm^2 FA531 - 55mm^2	FA631 - 165mm^2 FA731 - 330mm^2 FA831 - 550mm^2
Maximum processing flow rate	FA331 - 300Nl/min (10.6 SCFM) FA431 - 600Nl/min (21.2 SCFM) FA531 - 1000Nl/min (35.3 SCFM) FA631 - 3000Nl/min (105.9 SCFM) FA731 - 6000Nl/min (211.9 SCFM) FA831 - 10000Nl/min (353.1 SCFM)	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4", 1", 1$^1/_2$", 2" BSP	
Materials of construction	Case - PC,A2011 Element - A5052P,SPCC glass fibre Packing - NBR Drain cock assembly - NBR,Nylon	
Installation dimensions	See overleaf	
Mass	FA331-0.2kg (0.44lb) FA631-0.6kg (1.32lb) FA431-0.3kg (0.66lb) FA731-1.1kg (2.43lb) FA531-0.4kg (0.88lb) FA831-1.5kg (3.31lb)	
Service kits - replacement element	FA331 - 15-5541 FA431 - 15-5542 FA531 - 15-5543	FA631 - 15-5544 FA731 - 15-5545 FA831 - 15-5546

4. Flow characteristics

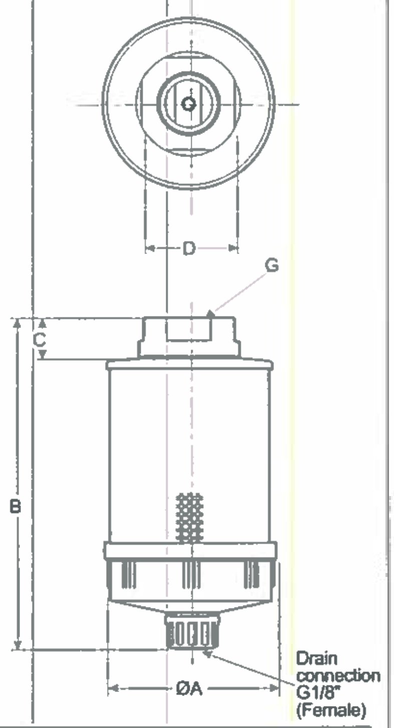


5. Installation dimensions in mm

FA331, FA431, FA531, FA631

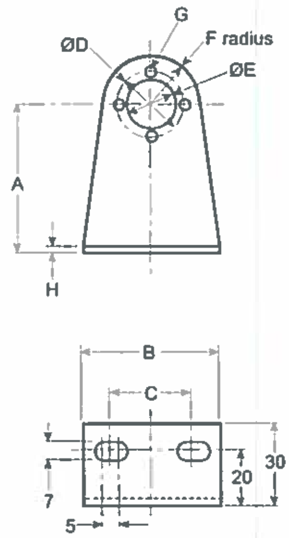


FA731, FA831



Model code	A	B	C	D	E	F	G
FA331	80	129	20	27	4 x M3, 7deep	24	G3/8"
FA431	90	147	23	32	4 x M4, 7deep	32	G1/2"
FA531	100	171	25	41	4 x M4, 7deep	40	G3/4"
FA631	112	195	28	46	4 x M4, 7deep	48	G1"
FA731	132	259	32	70	-	-	G1½"
FA831	150	312	36	80	-	-	G2"

Mounting Bracket

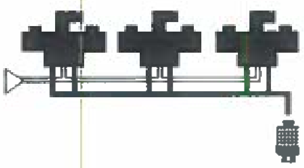


Bracket supplied with 4off fixing screws

Model code	A	B	C	D	E	F	G	H
B351-10A	55	50	30	24	18	16.5	4 x 3.5	2.3
B451-15A	60	60	40	32	23	20	4 x 4.5	2.3
B551-20A	70	70	40	40	29	25.4	4 x 4.5	3.2
B651-25A	80	70	40	48	37	27.5	4 x 4.5	3.2

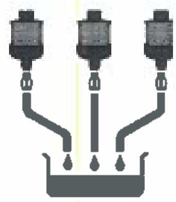
6. Precautions on use

1. Collective piping system
   Where multiple valves are used at one position it is recommended to use the collective piping system.



- Easy maintenance control
- Low cost

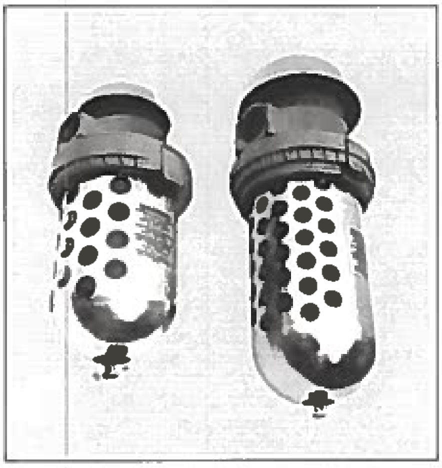
2. Oil discharge
   a) Oil deposited in the case must be discharged before it reaches the element.
   b) Remove drain cock and fit 1/8"BSP straight adaptor.
   c) Fit tube to adaptor and drain to suitable receptacle.



7. Ordering procedure

Order as preferred model selection to suit installation requirements.

Exhaust muffler / reclassifier - F23, F33
1/2", 3/4", 1" BSP



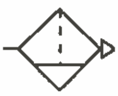
1. General description and application benefits

5 micron filter for trapping contaminated exhaust air and muffling it to atmosphere.

The units have one inlet port, the contaminants in the exhaust flow are mechanically separated and twice filtered to 5 micron levels. The clean, muffled exhaust air flows out of the unit under the top metal hood with a noise level of 85 decibels or less.

- Efficient noise reduction and oil mist removal from pneumatic systems.
- Assists in meeting COSHH regulations on noise.
- Environmental improvement (see leaflet EAP.010).
- 5 micron reusable element.
- Quick connect clamp ring for ease of bowl removal during servicing.
- Low pressure drop (back pressure).
- Metal bowl guard as standard.

2. Functional symbol



3. Preferred model selection

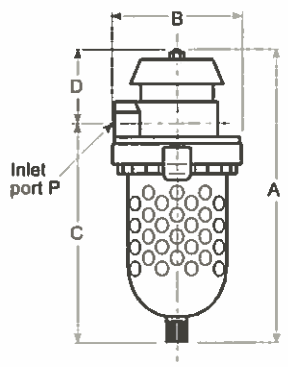
F23-C4-000	Exhaust muffler / reclassifier, 1/2" BSP
F33-C8-000	Exhaust muffler / reclassifier, 1" BSP

NOTE: 1) If unit is required for 3/4" BSP applications this must be specified at time of order and unit supplied will be F33-C8-000 plus 1" to 3/4" reducer number LA168-34-27.
2) Units available with metal bowl to special order - add letter 'M' in position 6 of model code number i.e. F23-C4-M00.

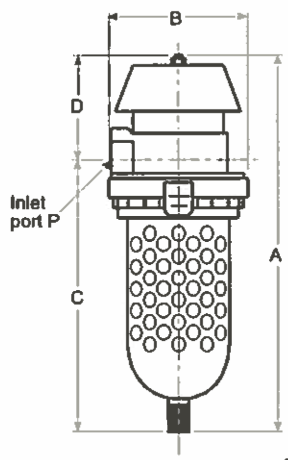
4. Operating data

Maximum operating pressure	10bar (150psig)	
Maximum operating temperature	52°C (125°F)	
Standard filtration	5 micron	
Retention capacity	F23-C4-000 F33-C8-000	94.4 cm³ 33.6 cm³
Maximum flow	F23-C4-000 F33-C8-000	80.0 dm³/sec (169.5 scfm) 135.0 dm³/sec (286.0 scfm)
Type of connection	Screwthread	
Thread size	1/2", 3/4", 1"BSP	
Materials of construction	Body - Zinc Bowl - Polycarbonate or aluminium Bowl guard - Aluminium Seals - Nitrile	
Installation dimensions	See below	
Mounting bracket	GRP-95-734	
Mass	F23-C4-000 F33-C8-000	1.41kg (3.12lb) 2.72kg (6.00lb)
Service kits - Repair kit	FRP-95-169 (for F23) FRP-95-170 (for F33)	

5. Installation dimensions in mm



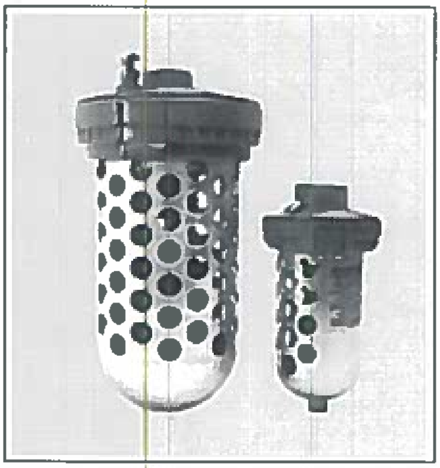
F23



F33

Model code	A	B	C	D	P
F23-C4-000	274	94	216	58	G1/2"
F33-C8-000	412	117	320	92	G1"

Automatic drains - X02, X01
1/2" BSP

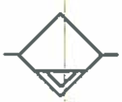


1. General description and application benefits

Automatic mechanical drain units for discharging water and contaminants from drain legs.

- Fully automatic - float operated.
- X01-Heavy duty mechanical drain.
- Quick connect clamp ring for ease of bowl removal during servicing.
- Internal pilot operated.
- Transparent bowl.
- Metal bowl guard as standard.
- Full 1/2" BSP drain inlet
- No electrical connections

2. Functional symbol



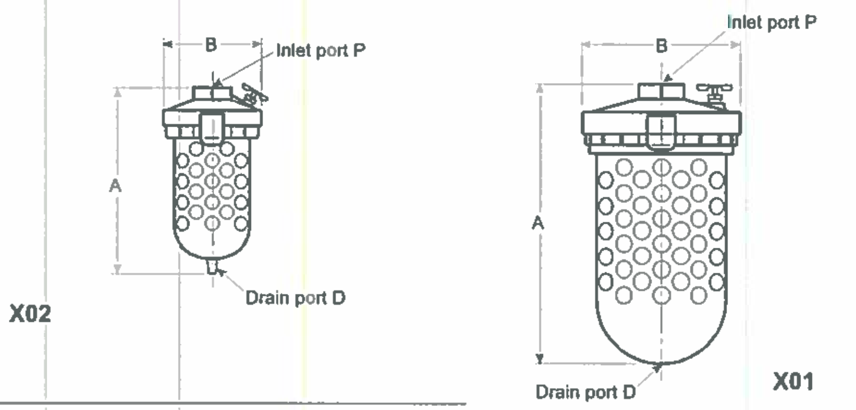
3. Preferred model selection

X02-C4-F00	Automatic drain, 1/2"BSP
X01-C4-000	Automatic drain, 1/2"BSP, heavy duty mechanical drain

4. Operating data

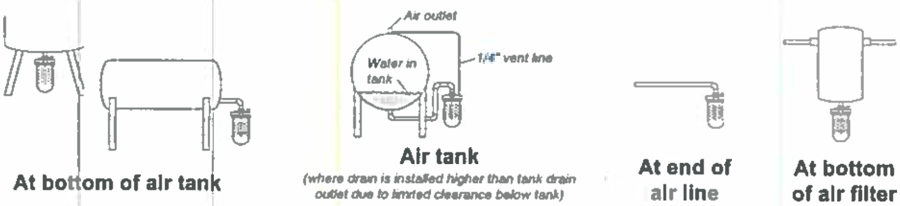
Maximum operating pressure	10bar (150psig)	
Maximum operating temperature	52°C (125°F)	
Bowl capacity	X02-C4-F00 X01-C4-000	0.15 litre (5.3 fl.ozs) 0.95 litre (33.4 fl.ozs)
Drain rate *at 7bar (100psig)*	X02-C4-F00 X01-C4-000	300 litres/hr (66 GPH) 570 litres/hr (125 GPH)
Type of connection	Screwthread	
Thread size	1/2"BSP (main connection) 1/8"BSP (drain connection)	
Materials of construction	Body - Zinc Bowl - Polycarbonate Bowl guard - Aluminium Seals - Nitrile	
Installation dimensions	See below	
Mass	X02-C4-F00 X01-C4-000	0.49kg (1.08lb) 1.92kg (4.23lb)
Service kits - Auto drain assembly - Bowl 'O' ring	GRP-96-200(for X02) XRP-96-244(for X01) GRP-95-259(for X02) GRP-95-256(for X01)	

5. Installation dimensions in mm

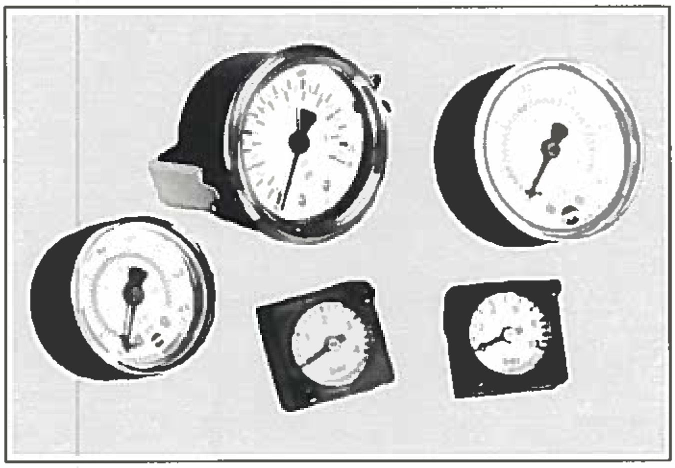


Model code	A	B	D	P
X02-C4-F00	149	78	G1/8"	G1/2"
X01-C4-000	217	119	G1/8"	G1/2"

6. Typical installations



Pressure gauges



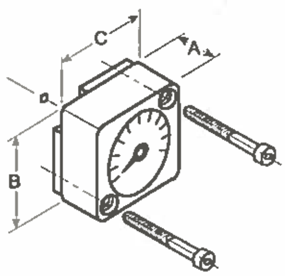
1. General description

A complete range of pressure gauges for use with the Pegasus air treatment equipment and/or any other compressed air application where display of pressure is required.

The unique flush mounted gauges are specially designed for use with the 08 and 8000 Series products.

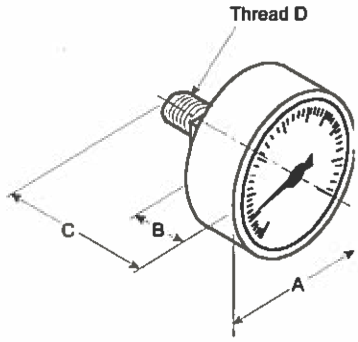
The centre back mounted products can be used in any application where a suitable BSP connection is available and the panel mounted version is specifically for applications where the display point (usually on a control panel) is remote from the pressure take off point.

Flush mounted - 08 and 8000 Series



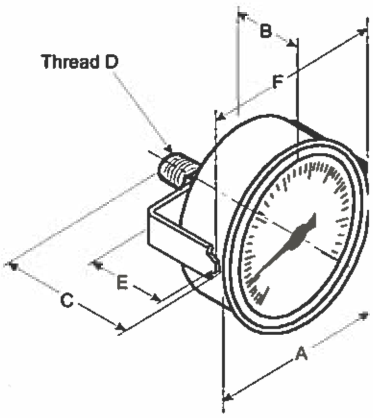
Part number	Range	A	B	C
GRP-96-722	0 - 11 bar	15	27	27
GRP-96-723	0 - 4 bar	15	27	27

Centre back mounted



Part number	Range	A	B	C	D
MF1415 - 4	0 - 4bar	40	24.5	43	R1/8"
MF1415 - 10	0 - 10bar	40	24.5	43	R1/8"
F2615 - 4	0 - 4bar	50	28	46	R1/4"
F2615 - 10	0 - 10bar	50	28	46	R1/4"

Panel mounted



Part number	Range	A	B	C	D	E	F
SG2 - 10	0 - 10bar	54	29	54	R1/8"	34.5	60

Panel hole diameter = 50mm
Maximum panel thicknes = 3.5mm

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel:- (01952) 586000 Fax:- (01952) 586798

APPROVED TO BS EN ISO 9001 QUALITY STANDARD CERTIFICATE No. Q10708

AIR LINE FITTINGS and TUBE

Z Joint instant fittings (thread to tube)

		Series	Tube o.d.	Thread	Page numbers
Straight adaptor		ZH	4mm to 12mm	M5 to R1/2"	Z 2.1
Straight adaptor cylindrical		ZH-S	4mm to 12mm	M5 to R1/2"	Z 2.1
90° swivel elbow adaptor		ZL	4mm to 12mm	M5 to R1/2"	Z 2.1
90° extended swivel elbow adaptor		ZL-L	4mm to 12mm	R1/8" to R1/2"	Z 2.2
45° swivel elbow adaptor		Z45L	4mm to 12mm	M5 to R1/2"	Z 2.2
Universal elbow		ZL-R	4mm to 12mm	M5 to R1/2"	Z 2.3
Swivel tee adaptor		ZC	4mm to 12mm	M5 to R1/2"	Z 2.4
Swivel side tee adaptor		ZD	4mm to 12mm	M5 to R1/2"	Z 2.4
Straight connector Y type		ZY-N	4mm to 12mm	M5 to R1/2"	Z 2.5

Z Joint instant fittings (tube to tube)

		Series	Tube o.d. ①	Tube o.d. ②	Page numbers
Equal elbow connector		ZF	4mm to 12mm	4mm to 12mm	Z 2.2
Double elbow connector		ZFY	4mm to 12mm	4mm to 12mm	Z 2.3
Tripod connector		ZTR	4mm to 12mm	4mm to 12mm	Z 2.3
Tee connector		ZT	4mm to 12mm	4mm to 12mm	Z 2.4
Straight connector Y type		ZY	4mm to 12mm	4mm to 12mm	Z 2.5
Double Y type connector		ZWY	6mm to 8mm	4mm to 6mm	Z 2.5
Stem elbow adaptor		ZL-P	4mm to 12mm	4mm to 12mm	Z 2.6
Stem tee adaptor		ZC-P	4mm to 12mm	4mm to 12mm	Z 2.6
Stem Y type adaptor		ZY-P	4mm to 12mm	4mm to 12mm	Z 2.6
Straight connector		ZS	4mm to 12mm	4mm to 12mm	Z 2.7
Bulkhead connector Push-in to push-in		ZX	4mm to 12mm	4mm to 12mm	Z 2.7
Bulkhead connector Push-in to compression		ZK	4mm to 12mm	4mm to 12mm	Z 2.7

AIR LINE FITTINGS and TUBE

Z Joint instant fittings (tube to tube) - *continued*

		Series	Tube o.d. ①	Tube o.d. ②	Page numbers
Equal ended cross		ZCR	8mm to 12mm	8mm to 12mm	Z 2.8
Reducer / enlarger		ZR	4mm to 10mm	6mm to 12mm	Z 2.8
Blanking plug		SLM-BV	4mm to 12mm		Z 2.8
Block manifold - single		ZM	4mm to 8mm	6mm to 10mm	Z 2.9
Block manifold - double		ZBM	4mm to 8mm	8mm to 12mm	Z 2.9

Related fittings

		Series	Thread ①	Thread ②	Page numbers
Male to male adaptor		LA121	M5 to R1"	M5 to R1"	L 1.1
Screwed plug		LA205	M5 to R1"		L 1.1

		Series	Male thread	Female thread	Page numbers
Male to female reducer		LA168	R1/8" to G1"	M5 to G3/4"	L 1.1
Copper washers		LA138	For G1/8" to G1"		L 1.1

APPROVED TO BS EN ISO 9001
QUALITY STANDARD
CERTIFICATE No. Q10706

AIR LINE FITTINGS and TUBE

Related products

		Series	Thread size	Tube o.d.	Page numbers
Multi-tube connectors		LA2		4mm x 6 way, 4mm x 12 way 6mm x 6 way, 6mm x 12 way 8mm x 6 way, 8mm x 12 way	M 1.1 M 1.2
Banjo flow regulators		SC3G	M5 to R1/2"	4mm to 12mm	B 1.1

Tube

		Series	Tube o.d.	Options	Page numbers
Flexible nylon, Polyurethane, Polyurethane spring coil		LA141 LA142	4, 6, 8,10,12mm 4, 6, 8,10,12mm 4, 6, 8mm	30 metre coils - Natural, Black, Green, Red, Blue, Yellow 30 metre coils - Natural, Black, Red, Blue Working lengths 2m, 3m, 5m - Black	T 1.1 T 1.2
Tube cutter		AZ			T 1.2

VICKERS

Pneumatics

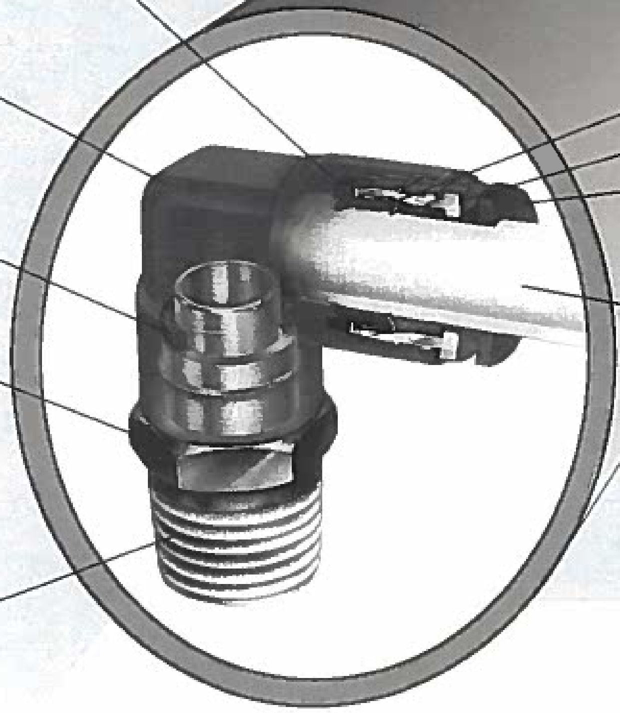
APPROVED TO BS EN ISO 9001
QUALITY STANDARD
CERTIFICATE No. Q10706

AIR LINE FITTINGS and TUBE

SECTION 8

The Power in Automation

NEW COMPACT Z JOINT



- Nickel plated brass - threaded parts
- Compact units for todays pneumatic elements
- Low connect / disconnect force
- Precoated PTFE sealant to all threads
- Vacuum to Pressure
- Large selection of sizes and types
- Greater flow
- All connectors can be fastened down

Specification

Fluid	Air
Working Pressure	0 - 10 bar (0 - 150 psig)
Negative pressure	10 Torr (-750mm Hg)
Working temperature	-15° C to + 60° C (5°F to 140°F)
Tubing types	Rigid nylon, Flexible nylon, Polyurethane, Fluoride plastic
Tube sizes	4, 6, 8, 10, 12mm
Thread	JIS B0203 (Taper pipe thread 'R'-PT)

Materials of construction

Body	Nickel plated brass (CZ121) PBT resin
Collet	Stainless steel (301)
Collet holder	Polyacetal
Outer ring	Nickel plated brass (CZ121)
Seals	Nitrile Butadiene Rubber (NBR)
Push ring	Polyacetal

Recommended tightening torques

Thread size	Tightening torque Nm (Kgf cm)
M5	0.5 - 1.0 (5 - 10)
R1/8"	3.0 - 5.0 (30 - 50)
R1/4"	6.0 - 8.0 (60 - 80)
R3/8"	13.0 - 15.0 (130 - 150)
R1/2"	16.0 - 18.0 (160 - 180)

Model code

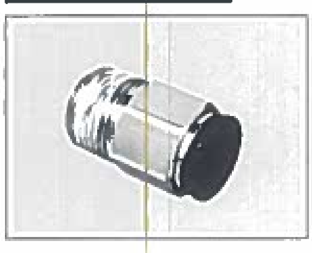
Z * * * - * * * *

[1] [2] [3] [4]

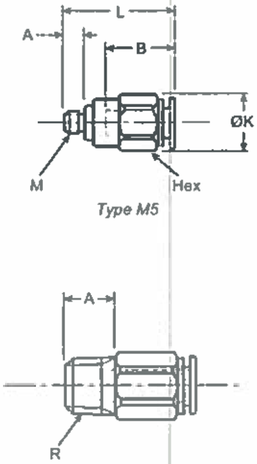
[1] Series
[2] Type
[3] Tube size
[4] Tube or thread size

Straight adaptor

Series **ZH**



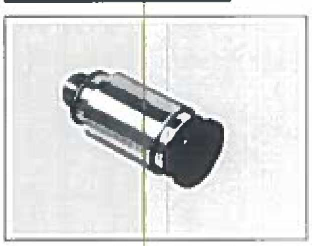
Part numbers and installation dimensions in mm



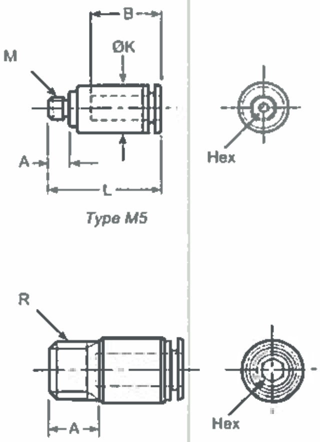
Part number	Tube o.d.	Thread M or R	Hex	K	L	A	B	Min ø orifice
ZH-045M	4	M5x0.8	10	11	21.5	4	16	2.5
ZH-041	4	1/8"	10	11	20.5	8	16	2.5
ZH-042	4	1/4"	14	15	19.5	11	16	2.5
ZH-065M	6	M5x0.8	12	13	23	4	17.5	2.5
ZH-061	6	1/8"	12	13	23	8	17.5	4
ZH-062	6	1/4"	14	15	23.5	11	17.5	4
ZH-063	6	3/8"	17	18.5	21.5	12	17.5	4
ZH-081	8	1/8"	14	15	28	8	19	5
ZH-082	8	1/4"	14	15	27	11	19	6
ZH-083	8	3/8"	17	18.5	22.5	12	19	6
ZH-101	10	1/8"	17	18.5	31	8	21.5	5
ZH-102	10	1/4"	17	18.5	32.5	11	21.5	8
ZH-103	10	3/8"	17	18.5	28.5	12	21.5	8
ZH-104	10	1/2"	22	24	26.5	15	21.5	8
ZH-122	12	1/4"	19	21	35.5	11	23	6
ZH-123	12	3/8"	19	21	30.5	12	23	8
ZH-124	12	1/2"	22	24	29.5	15	23	8

Straight adaptor - cylindrical

Series **ZH-S**



Part numbers and installation dimensions in mm

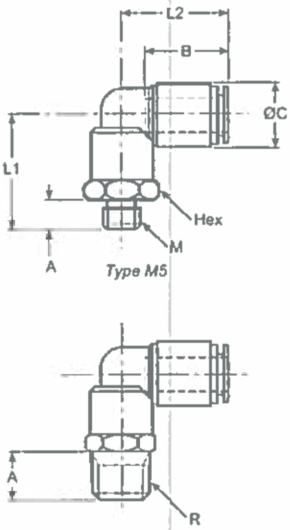


Part number	Tube o.d.	Thread M or R	Hex	K	L	A	B	Min ø orifice
ZH-045MS	4	M5x0.8	2	9.8	21.5	4	16	2
ZH-041S	4	1/8"	2.5	9.8	20.5	8	16	2.5
ZH-065MS	6	M5x0.8	2	11.8	23	4	17.5	2
ZH-061S	6	1/8"	4	11.8	23	8	17.5	4
ZH-062S	6	1/4"	4	13.8	23	11	17.5	4
ZH-081S	8	1/8"	5	14	28	8	19	5
ZH-082S	8	1/4"	6	14	27	11	19	6
ZH-083S	8	3/8"	6	17	22.5	12	19	6
ZH-101S	10	1/8"	5	17.5	30.5	8	21.5	5
ZH-102S	10	1/4"	6	17.5	28.5	11	21.5	6
ZH-103S	10	3/8"	8	17.5	28.5	12	21.5	8
ZH-104S	10	1/2"	8	22	26.5	15	21.5	8
ZH-122S	12	1/4"	6	19.5	34	11	23	6
ZH-123S	12	3/8"	8	19.5	29.5	12	23	8
ZH-124S	12	1/2"	8	22	28.5	15	23	8

90° swivel elbow adaptor

Series **ZL**

Part numbers and installation dimensions in mm

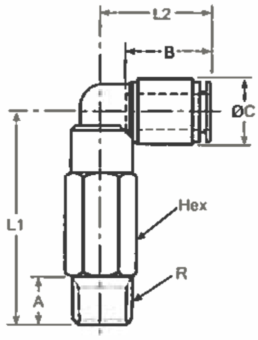


Part number	Tube o.d.	Thread M or R	Hex	L1	L2	A	B	C	Min ø orifice
ZL-045M	4	M5x0.8	8	15	18	4	16	10	2.5
ZL-041	4	1/8"	10	20.5	18.5	8	16	10	2.5
ZL-042	4	1/4"	14	24	18.5	11	16	10	2.5
ZL-065M	6	M5x0.8	8	15	20	4	17.5	12.5	2.5
ZL-061	6	1/8"	12	24	21	8	17.5	12.5	4
ZL-062	6	1/4"	14	27.5	21	11	17.5	12.5	4
ZL-063	6	3/8"	17	29	21	12	17.5	12.5	4
ZL-081	8	1/8"	14	25.5	23.5	8	19	14.5	6
ZL-082	8	1/4"	14	28.5	23.5	11	19	14.5	6
ZL-083	8	3/8"	17	30	23.5	12	19	14.5	6
ZL-101	10	1/8"	17	28	27	8	21.5	17.5	6.5
ZL-102	10	1/4"	17	31	27	11	21.5	17.5	8
ZL-103	10	3/8"	17	32.5	27	12	21.5	17.5	8
ZL-104	10	1/2"	22	35.5	27	15	21.5	17.5	8
ZL-122	12	1/4"	19	33	29.5	11	23	20	8.5
ZL-123	12	3/8"	19	34.5	29.5	12	23	20	8.5
ZL-124	12	1/2"	22	37.5	29.5	15	23	20	8.5

90° extended swivel elbow adaptor

Series **ZL-L**

Part numbers and installation dimensions in mm

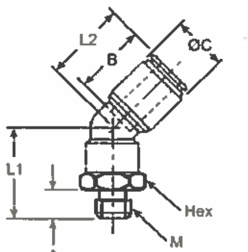


Part number	Tube o.d.	Thread R	Hex	L1	L2	A	B	C	Min ø orifice
ZL-041L	4	1/8"	10	35.5	18.5	8	16	10	2.5
ZL-042L	4	1/4"	14	39	18.5	11	16	10	2.5
ZL-061L	6	1/8"	12	40	21	8	17.5	12.5	4
ZL-062L	6	1/4"	14	43.5	21	11	17.5	12.5	4
ZL-081L	8	1/8"	14	44.5	23.5	8	19	14.5	6
ZL-082L	8	1/4"	14	47.5	23.5	11	19	14.5	6
ZL-083L	8	3/8"	17	49	23.5	12	19	14.5	6
ZL-102L	10	1/4"	17	56	27	11	21.5	17.5	8
ZL-103L	10	3/8"	17	57.5	27	12	21.5	17.5	8
ZL-104L	10	1/2"	22	60.5	27	15	21.5	17.5	8
ZL-122L	12	1/4"	19	60	29.5	11	23	20	8.5
ZL-123L	12	3/8"	19	61.5	29.5	12	23	20	8.5
ZL-124L	12	1/2"	22	64.5	29.5	15	23	20	8.5

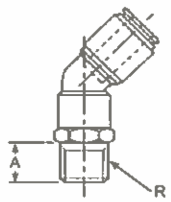
45° swivel elbow adaptor

Series **Z45L**

Part numbers and installation dimensions in mm



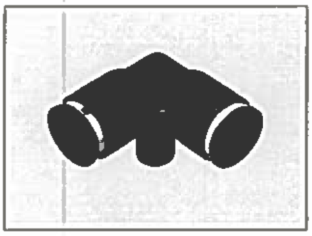
Type M5



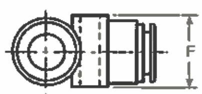
Part number	Tube o.d.	Thread M or R	Hex	L1	L2	A	B	C	Min ø orifice
Z45L-045M	4	M5x0.8	8	14.5	18	4	16	10	2.5
Z45L-041	4	1/8"	10	20.5	18	8	16	10	2.5
Z45L-042	4	1/4"	14	24	18	11	16	10	2.5
Z45L-065M	6	M5x0.8	8	15	18.5	4	17.5	12.5	2.5
Z45L-061	6	1/8"	12	23.5	20	8	17.5	12.5	4
Z45L-062	6	1/4"	14	27	20	11	17.5	12.5	4
Z45L-063	6	3/8"	17	28.5	20	12	17.5	12.5	4
Z45L-081	8	1/8"	14	25	22	8	19	14.5	6
Z45L-082	8	1/4"	14	28	22	11	19	14.5	6
Z45L-083	8	3/8"	17	29.5	22	12	19	14.5	6
Z45L-101	10	1/8"	17	26	25	8	21.5	17.5	6.5
Z45L-102	10	1/4"	17	29	25	11	21.5	17.5	8
Z45L-103	10	3/8"	17	30.5	25	12	21.5	17.5	8
Z45L-104	10	1/2"	22	33.5	25	15	21.5	17.5	8
Z45L-122	12	1/4"	19	30.5	27	11	23	20	8.5
Z45L-123	12	3/8"	19	32	27	12	23	20	8.5
Z45L-124	12	1/2"	22	35	27	15	23	20	8.5

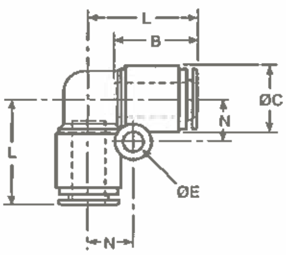
Equal elbow connector

Series **ZF**



Part numbers and installation dimensions in mm

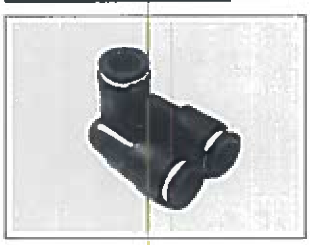




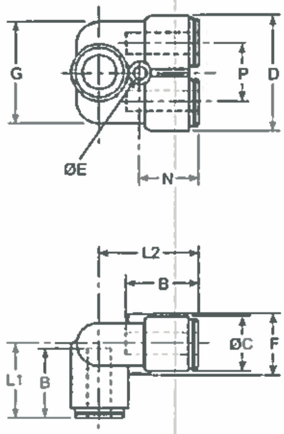
Part number	Tube o.d.	L	B	C	E	F	N	Min ø orifice
ZF-040	4	18.5	16	10	4.2	11	7.5	2.5
ZF-060	6	21	17.5	12.5	4.2	13.5	8.5	4
ZF-080	8	23.5	19	14.5	4.2	15.5	9.5	6
ZF-100	10	27	21.5	17.5	4.2	18.5	11	8
ZF-120	12	29.5	23	20	4.2	21	12	10

Double elbow connector

Series **ZFY**



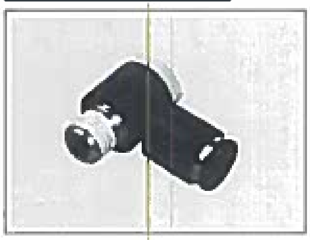
Part numbers and installation dimensions in mm



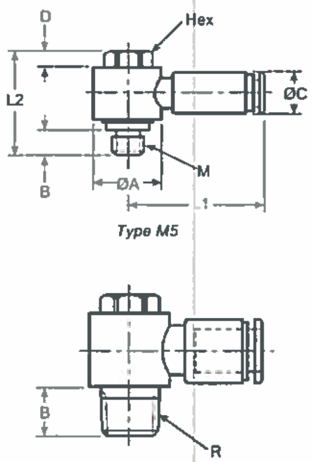
Part number	Tube o.d.	L1	L2	B	C	D	E	F	G	N	P	Min ø orifice
ZFY-04	4	17.5	23.5	16	10	21	3.2	11	18	15.5	11	2.5
ZFY-06	6	19.5	27	17.5	12.5	26	4.2	13.5	22.5	17	13.5	4
ZFY-08	8	22	29	19	14.5	30	4.2	15.5	26.5	18	15.5	6
ZFY-10	10	25.5	33	21.5	17.5	36	4.2	18.5	31.5	20	18.5	8
ZFY-12	12	28	35.5	23	20	41	4.2	21	37	21.5	21	10

Universal elbow

Series **ZL-R**



Part numbers and installation dimensions in mm

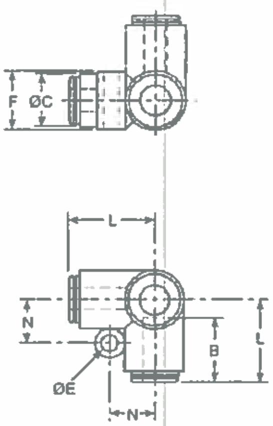


Part number	Tube o.d.	Thread M or R	Hex	L1	L2	A	B	C	D
ZL-045MR	4	M5x0.8	8	21.5	18.5	10	4	10	3
ZL-041R	4	1/8"	8	23	26	13	8	10	3
ZL-042R	4	1/4"	10	24	30	15	11	10	3.5
ZL-065MR	6	M5x0.8	8	22.5	18.5	10	4	12.5	3
ZL-061R	6	1/8"	8	24	26	13	8	12.5	3
ZL-062R	6	1/4"	10	25	30	15	11	12.5	3.5
ZL-063R	6	3/8"	14	27.5	36.5	20	12	12.5	4
ZL-081R	8	1/8"	10	26.5	29	15	8	14.5	4
ZL-082R	8	1/4"	12	28	32	17.6	11	14.5	4
ZL-083R	8	3/8"	14	29	36.5	20	12	14.5	4
ZL-102R	10	1/4"	14	31.5	35.5	20	11	17.5	4
ZL-103R	10	3/8"	14	31.5	36.5	20	12	17.5	4
ZL-104R	10	1/2"	17	34	42.5	25	15	17.5	4
ZL-122R	12	1/4"	17	35.5	38.5	25	11	20	4
ZL-123R	12	3/8"	17	35.5	39.5	25	12	20	4
ZL-124R	12	1/2"	17	35.5	42.5	25	15	20	4

Tripod connector

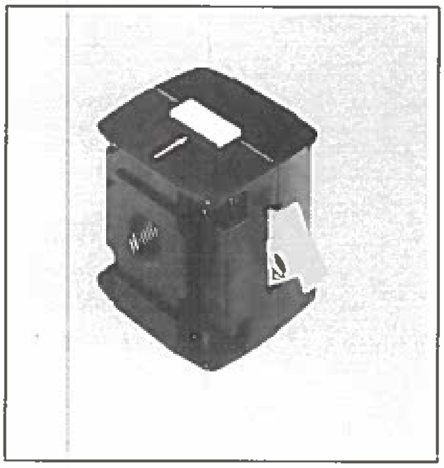
Series **ZTR**

Part numbers and installation dimensions in mm



Part number	Tube o.d.	L	B	C	E	F	N	Min ø orifice
ZTR-04	4	19	16	10	4.2	11	7.5	2.5
ZTR-06	6	21.5	17.5	12.5	4.2	13.5	8.5	4
ZTR-08	8	24	19	14.5	4.2	15.5	9.5	6
ZTR-10	10	27.5	21.5	17.5	4.2	18.5	13	8
ZTR-12	12	30	23	20	4.2	21	14	10

Safety shut off / exhaust valve - LV28
3/8", 1/2", 3/4" BSP



1. General description and application benefits

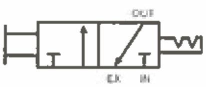
Manually operated slide type 3 way valve of modular design for installation immediately upstream of any filter, filter/ regulator or FRL units. Valve is secured to unit by means of joiner set.

In the closed position downstream air is exhausted to atmosphere. Particularly useful for isolating and depressurizing downstream units requiring maintenance or replacement.

Push / push operation gives positive open and closed positions. The valve slide can be locked in the closed position with a user supplied padlock. **

- Slide valve constuction.
- Downstream air exhausted in closed position. **
- High flow, high efficiency.
- Push / push action.
- Readily identifiable by bright orange colour of slide mechanism.
- Display provides visual check.
- Pad lockable in closed position. **

2. Functional symbol



** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.

3. Preferred model selection

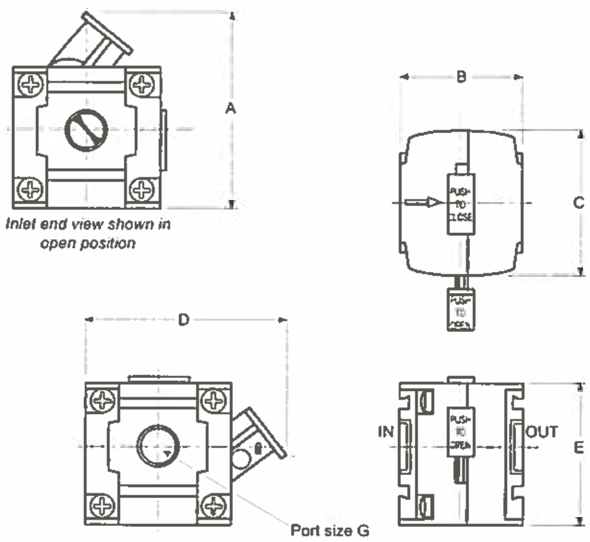
LV28-C3-0000	Modular safety shut off valve, manually operated, 3/8"BSP
LV28-C4-0000	Modular safety shut off valve, manually operated, 1/2"BSP
LV28-C6-0000	Modular safety shut off valve, manually operated, 3/4"BSP

4. Operating data

Maximum operating pressure	10bar (150psig)	
Maximum operating temperature	79°C (175°F)	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LV28-C3-0000 LV28-C4-0000 LV28-C6-0000	116 dm³/sec (245 scfm) 124 dm³/sec (263 scfm) 143 dm³/sec (305 scfm)
Exhaust flow *	Kv = 15.0 (Cv = 1.05)	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Materials of construction	Body - Zinc Blade - Acetal Seals - Nitrile	
Installation dimensions	See below	
Mountings	See page MA 3.1	
Accessories	See page MA 3.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 3.1	
Mass	0.41kg (0.90lb)	
Service kits	Replace unit	

*Note: * Kv (Cv) is for model LV28-C4-0000 at inlet pressure of 10 bar (150 psig).*

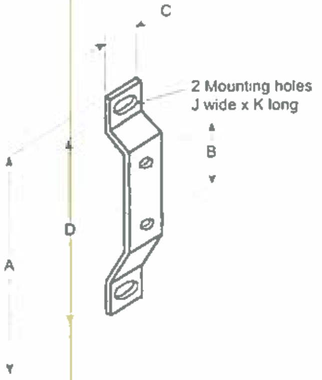
5. Installation dimensions in mm



Model code	A	B	C	D	E	G
LV28-C3-0000	82	58	65	86	58	G3/8"
LV28-C4-0000	82	58	65	86	58	G1/2"
LV28-C6-0000	82	58	65	86	58	G3/4"

Mountings and accessories

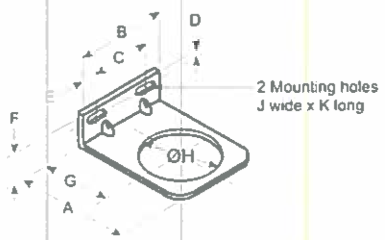
T Bracket



Part number	A	B	C	D	J	K
GPA-96-602	95	32	19.3	83	7.1	14

L Bracket

For LR28 series regulators and LB28 series filter / regulators

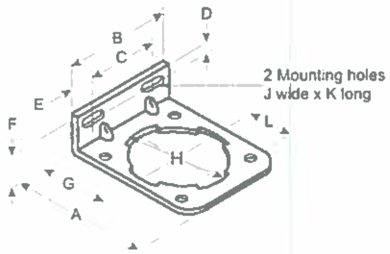


Part number	A	B	C	D	E
GPA-96-607	84.5	76	48	11	14

F	G	H	J	K
25	49	61	7.1	14

C Bracket

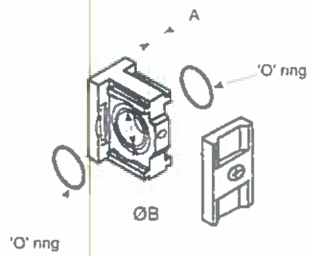
For LF28 series filters, LM28 series coalescing filters and LL28 series lubricators



Part number	A	B	C	D	E
GPA-96-605	85	76	48	11	14

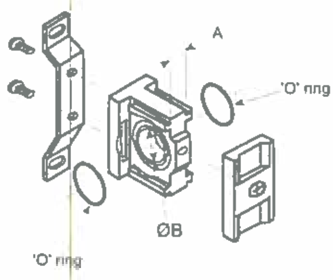
F	G	H	J	K	L
25	38	67.5	7.1	14	28

Joiner set



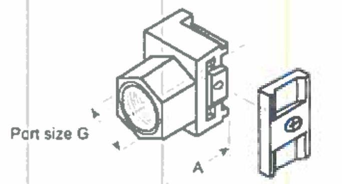
Part number	A	B
GPA-96-601	8.9	22.1

Joiner set also available with T bracket:-



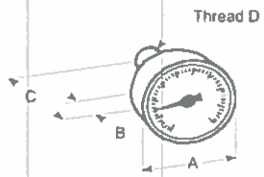
Part number	A	B
GPA-96-603	8.9	22.1

End block



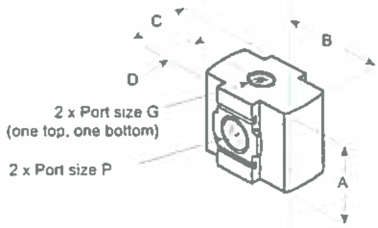
Part number	A	G
GPA-96-620	40	G 1/4"
GPA-96-621	40	G 3/8"
GPA-96-622	40	G 1/2"
GPA-96-623	40	G 3/4"

Gauge



Part number	Range	A	B	C	D
F2615 - 4	0 - 4bar	50	28	46	R1/4"
F2615 - 10	0 - 10bar	50	28	46	R1/4"

Distributor block



Standard distributor block:-

Part number	A	B	C	D	G	P
LN28-C6-0000	48	73	66	33	G1/2"	G3/4"

Distributor block with check valve:-

Part number	A	B	C	D	G	P
LN28-C6-C000	48	73	73	33	G1/2"	G3/4"

Options with Port 'G' diameters of 3/8" and 3/4" are also available - to special order.

Operating data

Maximum operating pressure	21bar (300 psig)
Maximum operating temperature	79°C (175° F)
Maximum flow*	305 dm³/sec (647 scfm)
Type of connection	Screwthread
Materials of construction	Body - Aluminium Check valve - Nitrile
Mass	LN28-C6-0000 0.94kg (2.07lb) LN28-C6-C000 1.08kg (2.38lb)

* *Value based at inlet pressure of 10 bar and pressure drop of 0.3bar*

VICKERS

Pneumatics

Particle filters - LF28
3/8", 1/2", 3/4" BSP

1. General description and application benefits

High performance filters designed to remove solid and liquid contaminants from compressed air lines.

The LF28 filter utilizes a 5 micron sintered polypropylene element giving superior filtration results.

Metal bowl options, with sight glass, are available.

All filters are available with manual drain as standard or optionally with automatic mechanical drain.

- High flow, high efficiency.
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Corrosion resistant nylon bowl guard with all round view slots.
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbols

** Conforms to EN 983 : 1994 *(Final draft)* **Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

L F 2 8 - C * - S * 0 0

[1] [2] [3]

[1] **Thread size**
3 = 3/8"
4 = 1/2"
6 = 3/4"

[2] **Element**
S = 5 micron

[3] **Bowl / Drain**
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

Preferred model selection

LF28-C3-SK00	Modular particle filter with polycarbonate bowl and manual drain, 3/8"BSP
LF28-C3-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 3/8"BSP
LF28-C4-SK00	Modular particle filter with polycarbonate bowl and manual drain, 1/2"BSP
LF28-C4-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 1/2"BSP
LF28-C6-SK00	Modular particle filter with polycarbonate bowl and manual drain, 3/4"BSP
LF28-C6-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 3/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/8"BSP, particle filter with metal bowl and automatic drain. Order as LF28-C3-SH00

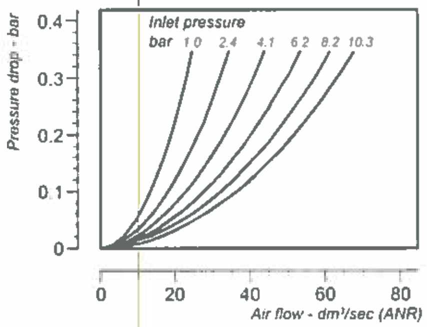
4. Operating data

Maximum operating pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Maximum operating temperature	Polycarbonate bowl Metal bowl	52°C (125°F) 79°C (175°F)
Standard filtration	5 micron	
Retention capacity	84.9 cm^3	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LF28-C3-SK00 LF28-C4-SK00 LF28-C6-SK00	68.0 dm^3/sec (144scfm) 72.0 dm^3/sec (152scfm) 79.2 dm^3/sec (168scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Materials of construction	Body - Zinc Body cap - ABS Bowl - Polycarbonate or Zinc Bowl guard - Polyamid Element - Sintered polypropylene Seals - Nitrile (Polycarbonate bowl) Fluorocarbon (Metal bowl)	
Installation dimensions	See overleaf	
Mountings	See page MA3 .1	
Accessories	See page MA3.1	
Port adaptors (when required)	1/4", 3/8",1/2", 3/4" BSP - See page MA3.1	
Mass	0.77kg (1.70lb)	
Service kits † - Replacement element - Retainer element baffle - Bowl assembly - Manual drain - Bowl 'O' ring	FRP-96-653 FRP-96-655 GRP-96-642 (Manual drain) GRP-96-643 (Automatic drain) GRP-96-685 GRP-96-654	

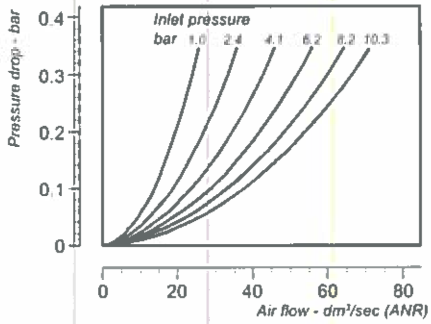
Notes: † Part numbers given are for standard units with polycarbonate bowls
- For service kits relating to other variants contact Customer Services Department.

5. Flow characteristics

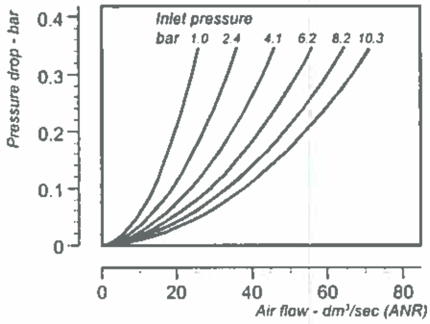
LF28-C3-SK00



LF28-C4-SK00

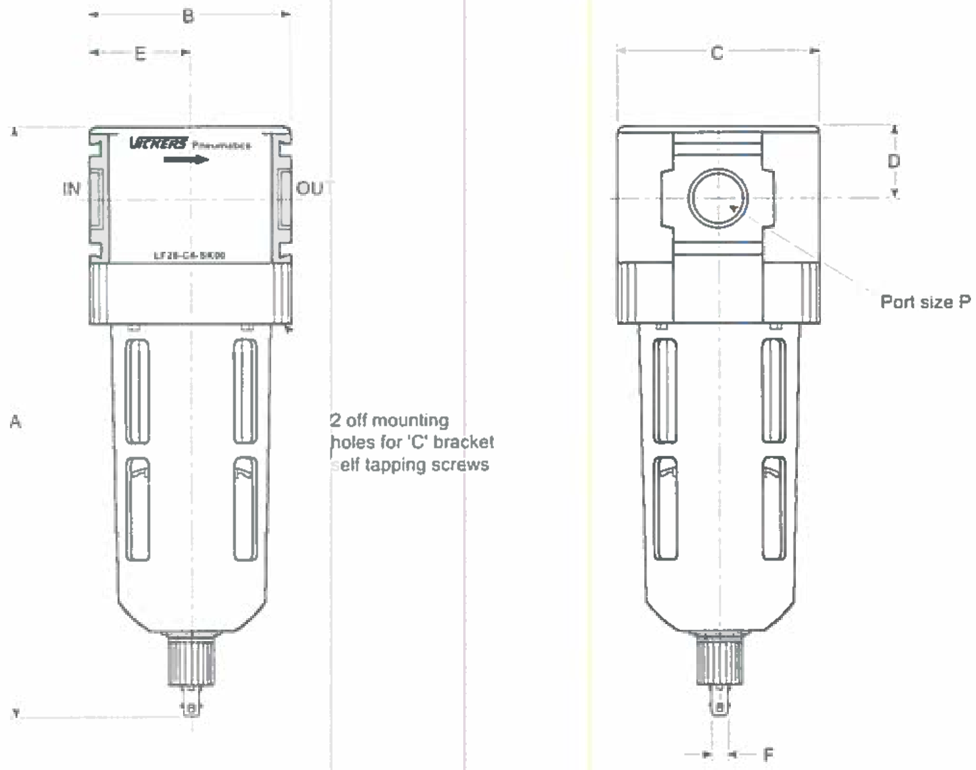


LF28-C6-SK00



Characteristics and requirements for compressed air filters are in accordance with ISO 5782-1, *Pneumatic fluid power - Compressed air filters - Part 1.*

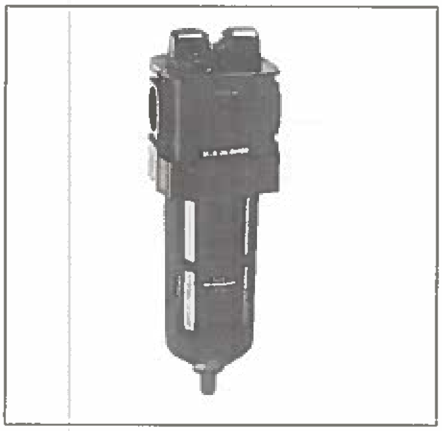
6. Installation dimensions in mm



Model code	A*	B	C†	D	E	F	P
LF28-C3-SK00	213	73	73	26	36	4.8mm I.D. tube barb fitting	G3/8"
LF28-C4-SK00	213	73	73	26	36	4.8mm I.D. tube barb fitting	G1/2"
LF28-C6-SK00	213	73	73	26	36	4.8mm I.D. tube barb fitting	G3/4"

* *For models with Auto Drain dimension A = 204mm.*
† *For models with Metal Bowls dimension C = 82mm*

Coalescing filters - LM28
3/8", 1/2", 3/4" BSP

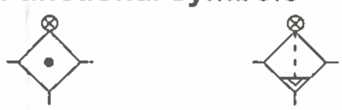


1. General description and application benefits

High performance coalescing filters for removal of water, oil aerosols and solid particulate contaminants down to 0.1ppm mg/m3.
The standard LM28 filters utilize a 0.01micron borosilicate cloth element with options of 0.5micron in the same material or 0.003micron activated carbon elements.
Metal bowl options, with sight glass, are available.
All filters are available with manual drain as standard or optionally with automatic mechanical drain.
It is recommended that the LF18 or LF28 standard 5 micron filter is installed upstream of the LM28 coalescing filter to maximize the service life of the coalescing filter element.

- High flow, high efficiency.
- Differential pressure indicator fitted as standard.**
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Corrosion resistant nylon bowl guard with all round view slot.
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbols



Manual drain — Automatic drain

** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L M 2 8 - C * - * * 0 0
[1] [2] [3]

[1] **Thread size**
3 = 3/8"
4 = 1/2"
6 = 3/4"

[2] **Element**
B = 0.5 micron (optional)
C = 0.01 micron (standard)
D = Activated carbon (optional)

[3] **Bowl / Drain**
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

3. Preferred model selection

LM28-C3-CK00	Modular coalescing filter with polycarbonate bowl and manual drain, 3/8"BSP
LM28-C3-CG00	Modular coalescing filter with polycarbonate bowl and automatic drain, 3/8"BSP
LM28-C4-CK00	Modular coalescing filter with polycarbonate bowl and manual drain, 1/2"BSP
LM28-C4-CG00	Modular coalescing filter with polycarbonate bowl and automatic drain, 1/2"BSP
LM28-C6-CK00	Modular coalescing filter with polycarbonate bowl and manual drain, 3/4"BSP
LM28-C6-CG00	Modular coalescing filter with polycarbonate bowl and automatic drain, 3/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/4"BSP, coalescing filter with 0.5micron element, polycarbonate bowl and automatic drain. Order as LM8-C6-BG00

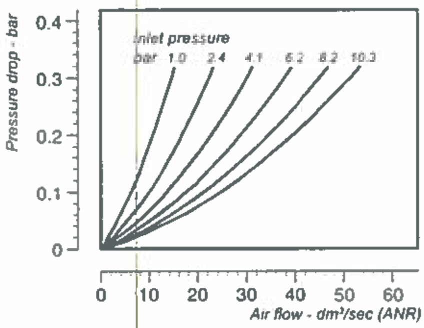
4. Operating data

Maximum operating pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 10bar (150psig)
Maximum operating temperature	Polycarbonate bowl Metal bowl	52°C (125°F) 79°C (175°F)
Standard filtration	0.003, 0.01 or 0.5 micron	
Retention capacity	84.9 cm^3	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LM28-C3-CK00 LM28-C4-CK00 LM28-C6-CK00	55.2 dm^3/sec (117scfm) 58.5 dm^3/sec (124scfm) 64.1 dm^3/sec (136scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Materials of construction	Body - Zinc Body cap - ABS Bowl - Polycarbonate or Zinc Bowl guard - Polyamid Element - Borosilicate cloth (type B,C) Activated carbon (type D) Seals - Fluorocarbon	
Installation dimensions	See overleaf	
Mountings	See page MA 3.1	
Accessories	See page MA 3.1	
Port adaptors (when required)	1/4", 3/8",1/2", 3/4" BSP - See page MA 3.1	
Mass	0.80kg (1.70lb)	
Service kits† - Replacement element	MSP-96-649 (0.5 micron) MTP-96-648 (0.01 micron)	
- Bowl assembly	GRP-96-642 (Manual drain) GRP-96-643 (Automatic drain)	
- Manual drain	GRP-96-685	
- Bowl 'O' ring	GRP-96-755	

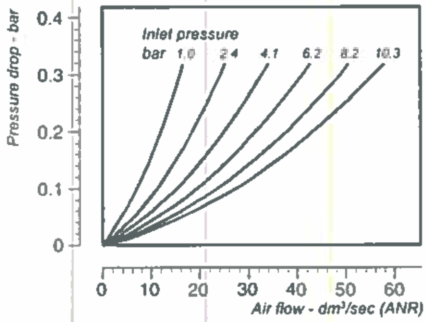
Notes: † Part numbers given are for standard units with polycarbonate bowls
- For service kits relating to other variants contact Customer Services Department.

5. Flow characteristics

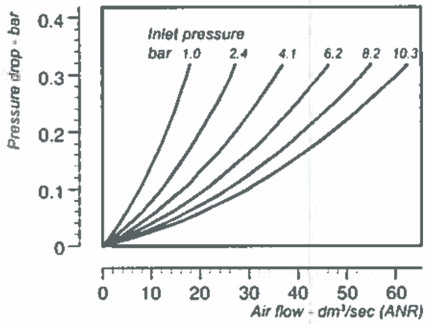
LM28-C3-CK00



LM28-C4-CK00

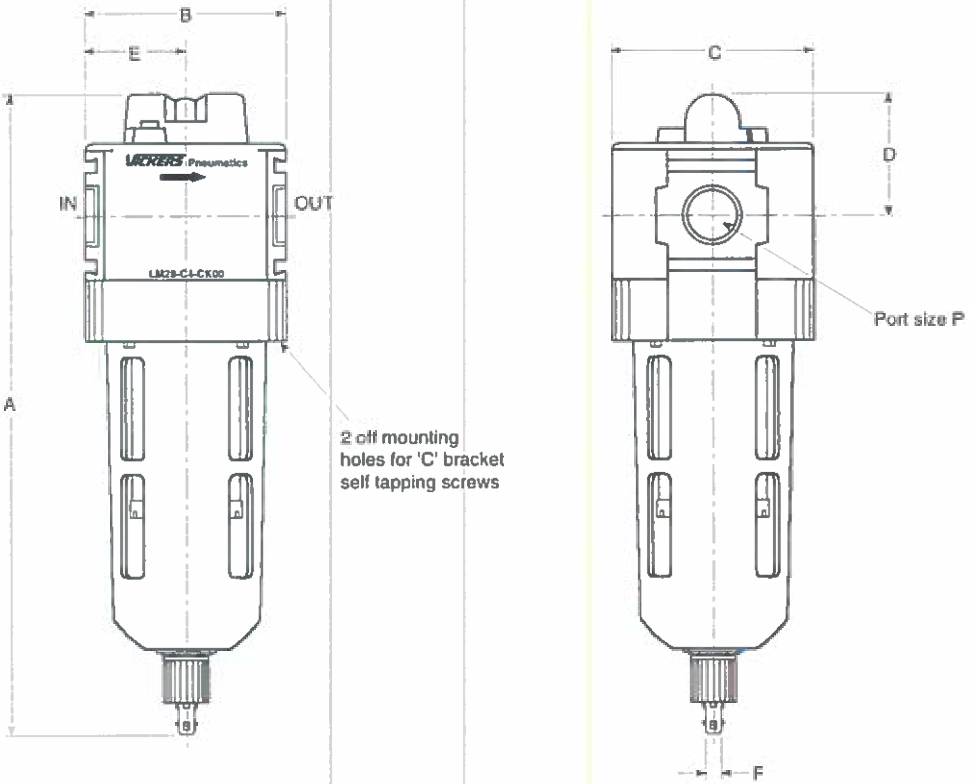


LM28-C6-CK00



Characteristics and requirements for compressed air filters are in accordance with ISO 5782-1, *Pneumatic fluid power - Compressed air filters - Part 1.*

6. Installation dimensions in mm



Can be modular mounted with LF 18 series standard particle filter

Model code	A*	B	C†	D	E	F	P
LM28-C3-CK00	235	73	73	48	36	4.8mm I.D. tube barb fitting	G3/8"
LM28-C4-CK00	235	73	73	48	36	4.8mm I.D. tube barb fitting	G1/2"
LM28-C6-CK00	235	73	73	48	36	4.8mm I.D. tube barb fitting	G3/4"

* *For models with Auto Drain dimension A = 226mm*
† *For models with Metal Bowls dimension C = 82mm*

Pneumatics

Regulators - LR28
3/8", 1/2", 3/4" BSP

1. General description and application benefits

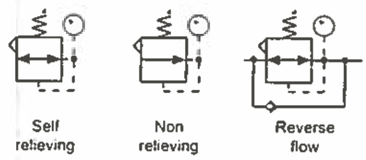
Spring loaded diaphragm type regulators featuring a balanced valve for superior regulation characteristics.

The LR28 regulators are provided with G1/4" gauge ports which can also be used as an additional regulator outlet if no pressure gauge is required.

The standard LR28 model is self relieving with non relieving available as an option.

- High flow, high efficiency.
- Self relieving **
  (Non relieving option available)
- Available with or without pressure gauge - gauge supplied separately.
- Integral body thread or port adaptors.
- Full range of accessories.
- Non rising adjustment.
- Available with full reverse flow function.

2. Functional symbols



** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L R 2 8 - C * - * 0 * *

[1] (thread size) [2] (diaphragm / spring range) [3] (options)

[1] Thread size
3 = 3/8"
4 = 1/2"
6 = 3/4"

[2] Diaphragm / Spring range
C = Self relieving / 0 - 1.7bar
D = Self relieving / 0 - 4.2bar
F = Self relieving / 0 - 8.5bar
G = Self relieving / 0 - 17.1bar
P = Non relieving / 0 - 1.7bar
Q = Non relieving / 0 - 4.2bar
R = Non relieving / 0 - 8.5bar
S = Non relieving / 0 - 17.1bar
(Codes 'F' and 'R' are standard)

[3] Options
0 = None
C = Tamper resistant adjustment
R = Reverse flow
(If one option only is required use first position followed by '0'. For more than one option enter in alphabetical order)

Preferred model selection

Model	Description
LR28-C3-F000	Modular self relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 3/8"BSP
LR28-C3-R000	Modular non relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 3/8"BSP
LR28-C4-F000	Modular self relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 1/2"BSP
LR28-C4-R000	Modular non relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 1/2"BSP
LR28-C6-F000	Modular self relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 3/4"BSP
LR28-C6-R000	Modular non relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 3/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/2"BSP, self relieving regulator with 0 - 4.2bar (0 - 60psig) range spring and fitted with tamper resistant kit. Order as LR28-C4-D0C0

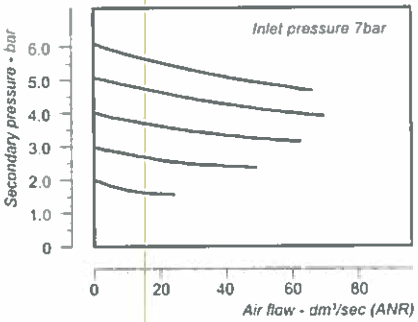
NOTE: Order pressure gauge separately - see page MA 3.1 and PG 1.1

4. Operating data

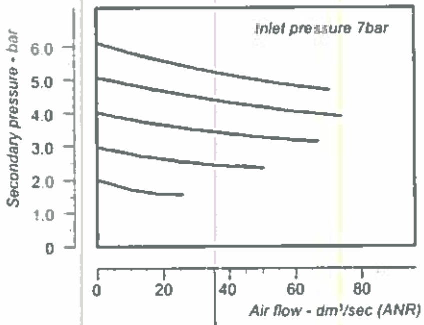
Maximum supply pressure	21bar (300 psig)	
Adjustment range pressure	0 - 1.7bar (0 - 25 psig) 0 - 4.2bar (0 - 60 psig) 0 - 8.5bar (0 - 125 psig) 0 - 17.1bar (0 - 250psig)	
Maximum operating temperature	79° C (175° F)	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LR28-C3-F000 LR28-C4-F000 LR28-C6-F000	66.0 dm³/sec (140scfm) 74.0 dm³/sec (157scfm) 75.5 dm³/sec (160scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Gauge ports	2 x 1/4"BSP	
Materials of construction	Body - Zinc Knob and panel nut - Acetal Bonnet - 33% glass filled nylon Valve assembly - Brass/nitrile Diaphragm assembly - Nitrile/zinc Springs - Steel (top), stainless steel (bottom) Seals - Nitrile	Body cap - ABS
Installation dimensions	See overleaf	
Mountings	See page MA 3.1	
Accessories	See page MA 3.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 3.1	
Mass	0.77kg (1.70lb)	
Service kits - Diaphragm assembly	RRP-96-682 (Self relieving) RRP-96-683 (Non relieving)	
- Valve assembly kit	RRP-96-684	
- Pressure springs (0 - 1.7bar)	RRP-96-614	
(0 - 4.2bar)	RRP-96-615	
(0 - 8.5bar)	RRP-96-624	
(0 - 17.1bar)	RRP-96-625	
- Plastic panel nut	RRP-96-676	

5. Flow characteristics

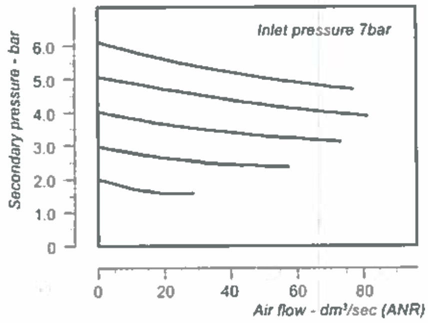
LR28-C3-F000



LR28-C4-F000

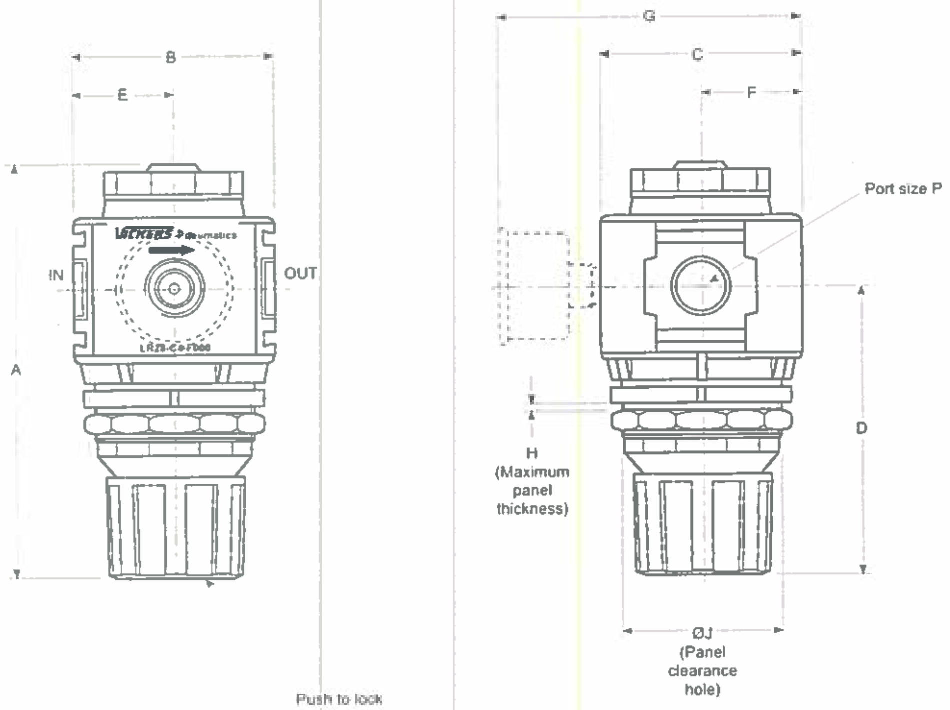


LR28-C6-F000



Characteristics and requirements for air line pressure regulators are in accordance with ISO 6953-1, *Pneumatic fluid power air line pressure regulators - Part 1.*

6. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	H	J	P
LR28-C3-F000	149	73	73	105	37	37	108	5	61	G3/8"
LR28-C4-F000	149	73	73	105	37	37	108	5	61	G1/2"
LR28-C6-F000	149	73	73	105	37	37	108	5	61	G3/4"

Note: - Panel mounting ring supplied as standard.

VICKERS

Pneumatics

Product	Port size	Model code	Description	Maximum flow	Page numbers
Safety shut off/ exhaust valve	G3/8"	LV28-C3-0000	Manual	116 dm³/sec	E 3.1
	G1/2"	LV28-C4-0000	Manual	124 dm³/sec	
	G3/4"	LV28-C6-0000	Manual	143 dm³/sec	
Mounting accessories		GPA-96-601	Joiner set		MA 3.1
		GPA-96-603	T Bracket + J set		
		GPA-96-606	L Bracket		
Gauges	R1/4"	F2615-4	0 - 4 bar		MA 3.1
	R1/4"	F2615-10	0 - 10 bar		
Particle filters	G3/8"	LF28-C3-SK00	Manual drain	68.0 dm³/sec	F 3.1 F 3.2
	G3/8"	LF28-C3-SG00	Auto drain	68.0 dm³/sec	
	G1/2"	LF28-C4-SK00	Manual drain	72.0 dm³/sec	
	G1/2"	LF28-C4-SG00	Auto drain	72.0 dm³/sec	
	G3/4"	LF28-C6-SK00	Manual drain	79.2 dm³/sec	
	G3/4"	LF28-C6-SG00	Auto drain	79.2 dm³/sec	
Coalescing filters	G3/8"	LM28-C3-CK00	Manual drain	55.2 dm³/sec	M 3.1 M 3.2
	G3/8"	LM28-C3-CG00	Auto drain	55.2 dm³/sec	
	G1/2"	LM28-C4-CK00	Manual drain	58.5 dm³/sec	
	G1/2"	LM28-C4-CG00	Auto drain	58.5 dm³/sec	
	G3/4"	LM28-C6-CK00	Manual drain	64.1 dm³/sec	
	G3/4"	LM28-C6-CG00	Auto drain	64.1 dm³/sec	
Regulators	G3/8"	LR28-C3-F000	Self relieving	66.0 dm³/sec	R 3.1 R 3.2
	G3/8"	LR28-C3-R000	Non relieving	66.0 dm³/sec	
	G1/2"	LR28-C4-F000	Self relieving	74.0 dm³/sec	
	G1/2"	LR28-C4-R000	Non relieving	74.0 dm³/sec	
	G3/4"	LR28-C6-F000	Self relieving	75.5 dm³/sec	
	G3/4"	LR28-C6-R000	Non relieving	75.5 dm³/sec	
Filter Regulators	G3/8"	LB28-C3-FK00	Manual drain	66.0 dm³/sec	B 3.1 B 3.2
	G3/8"	LB28-C3-FG00	Auto drain	66.0 dm³/sec	
	G1/2"	LB28-C4-FK00	Manual drain	71.0 dm³/sec	
	G1/2"	LB28-C4-FG00	Auto drain	71.0 dm³/sec	
	G3/4"	LB28-C6-FK00	Manual drain	78.0 dm³/sec	
	G3/4"	LB28-C6-FG00	Auto drain	78.0 dm³/sec	
Lubricators	G3/8"	LL28-C3-LK00	Manual drain	83.0 dm³/sec	L 3.1 L 3.2
	G1/2"	LL28-C4-LK00	Manual drain	86.8 dm³/sec	
	G3/4"	LL28-C6-LK00	Manual drain	94.3 dm³/sec	
Filter/Regulator, Lubricator combinations	G3/8"	LD28-C3-FKG0	Manual drain	66.0 dm³/sec	D 3.1 D 3.2
	G3/8"	LD28-C3-FGG0	Auto drain	66.0 dm³/sec	
	G1/2"	LD28-C4-FKG0	Manual drain	74.0 dm³/sec	
	G1/2"	LD28-C4-FGG0	Auto drain	74.0 dm³/sec	
	G3/4"	LD28-C6-FKG0	Manual drain	75.5 dm³/sec	
	G3/4"	LD28-C6-FGG0	Auto drain	75.5 dm³/sec	
Filter, Regulator, Lubricator combinations	G3/8"	LC28-C3-FKG0	Manual drain	66.0 dm³/sec	C 3.1 C 3.2
	G3/8"	LC28-C3-FGG0	Auto drain	66.0 dm³/sec	
	G1/2"	LC28-C4-FKG0	Manual drain	74.0 dm³/sec	
	G1/2"	LC28-C4-FGG0	Auto drain	74.0 dm³/sec	
	G3/4"	LC28-C6-FKG0	Manual drain	75.5 dm³/sec	
	G3/4"	LC28-C6-FGG0	Auto drain	75.5 dm³/sec	
Slow start valve	G3/8"	LS28-C3-A000	Air operated	87.7 dm³/sec	SS 3.1 SS 3.2
	G3/8"	LS28-C3-E0††	Solenoid op	87.7 dm³/sec	
	G1/2"	LS28-C4-A000	Air operated	105.0 dm³/sec	
	G1/2"	LS28-C4-E0††	Solenoid op	105.0 dm³/sec	
	G3/4"	LS28-C6-A000	Air operated	97.2 dm³/sec	
	G3/4"	LS28-C6-E0††	Solenoid op	97.2 dm³/sec	
Emergency stop valve with slow start	G3/8"	LE28-C3-E0††	With solenoid op	92.5 dm³/sec	E 3.1 E 3.2
	G1/2"	LE28-C4-E0††	With solenoid op	99.0 dm³/sec	
	G3/4"	LE28-C6-E0††	With solenoid op	108.5 dm³/sec	

Note: †† = Voltage code - to be specified at time of ordering.

Options

- Metal bowls with sight glass
- Alternative filter elements
- Non relieving and reverse flow regulators
- Low and high pressure springs
- Tamper resistant kits for regulators and lubricators

See relevant product pages

Modular end blocks - 1/4", 3/8", 1/2", 3/4" BSP — MA 3.1

28 Series 3/8", 1/2", 3/4" BSP

Pegasus AIR TREATMENT and CONTROL

Extract from:-

EN 983 : 1994 *(Final draft)* - Safety requirements for fluid power systems and their components - Pneumatics.

"Scope

This standard applies to pneumatic systems and their components on machinery.

It identifies hazards and factors which affect the safety of systems and their components when they are put to their intended use.

Gas bottles and receivers are excluded from the scope of this standard. For receivers see EN286-1.

The principles specified apply to the design, construction and modification of new systems and their components and aspects of use including:

- assembly
- installation
- adjustment
- operation
- cleaning and
- maintenance

Components are covered in the standard, but only to the extent that safety requirements are given to allow the components to be safely integrated into the system design.

The standard applies to systems and their components on machinery that are manufactured after the date of the adoption of this standard."

VICKERS

Pneumatics

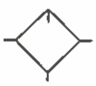
Lubricators - LL28
3/8", 1/2", 3/4" BSP

1. General description and application benefits

The LL28 series lubricator injects an oil mist into the flowing air stream of a pneumatic circuit to automatically provide the proper internal lubrication for air operated tools and other air operated devices.
The precise amount of oil to be delivered to the air stream is determined by the integral adjusting knob needle valve which sets the exact oil drip rate and can be adjusted without tools.
The self adjusting vane automatically maintains a constant oil to air ratio by opening and closing in response to a wide range of changing air flows.
A feature of the LL28 series lubricator is that it can be refilled without shutting off the air pressure. **

- Self adjusting oil feed
- High flow, high efficiency.
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Manual drain cock with barb tube fitting.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbol



** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

LL28 - C $\underset{\boxed{1}}{*}$ - L $\underset{\boxed{2}}{*}$ $\underset{\boxed{3}}{*}$ 0

[1] **Thread size**
3 = 3/8"
4 = 1/2"
6 = 3/4"

[2] **Bowl / Drain**
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

[3] **Options**
0 = None
T = Tamper resistant adjustment

Preferred model selection

LL28-C3-LK00	Modular lubricator with polycarbonate bowl and manual drain, 3/8"BSP
LL28-C4-LK00	Modular lubricator with polycarbonate bowl and manual drain, 1/2"BSP
LL28-C6-LK00	Modular lubricator with polycarbonate bowl and manual drain, 3/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/4"BSP, lubricator with metal bowl and manual drain and tamper resistant adjustment. Order as LL28-C6-LLT0

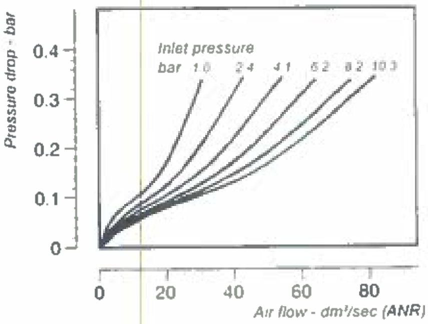
4. Operating data

Maximum operating pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Maximum operating temperature	Polycarbonate bowl Metal bowl	52°C (125°F) 79°C (175°F)
Reservoir capacity	181 cm³	
Recommended lubrication	ISO VG32	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LL28-C3-LK00 LL28-C4-LK00 LL28-C6-LK00	83.0 dm³/sec (176 scfm) 86.8 dm³/sec (184 scfm) 94.3 dm³/sec (200 scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Materials of construction	Body - Zinc Body cap - ABS Bowl - Polycarbonate or Zinc Bowl guard - Polyamid Sight dome or sight gauge - Polyamide Seals - Nitrile (Polycarbonate bowl) Fluorocarbon (Metal bowl)	
Installation dimensions	See overleaf	
Mountings	See page MA 3.1	
Accessories	Tamper resistant cap Force fill adaptor and See page MA 3.1	LRP-96-680 LRP-96-704
Port adaptors (when required)	1/4", 3/8",1/2", 3/4" BSP - See page MA 3.1	
Mass	0.90kg (1.90lb)	
Service kits † - Bowl assembly - Manual drain - Bowl 'O' ring - Siphon tube assembly - Bypass assembly - 'O' ring, fill plug	LRP-96-702 GRP-96-685 GRP-96-654 LRP-96-681 LRP-96-678 LRP-96-679	

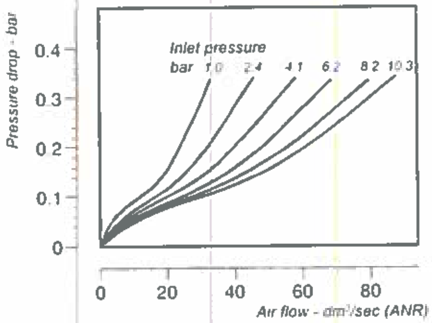
Notes: † Part numbers given are for standard units with polycarbonate bowls
- For service kits relating to other variants contact Customer Services Department

5. Flow characteristics

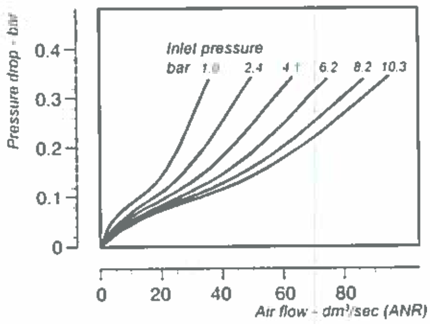
LL28-C3-LK00



LL28-C4-LK00

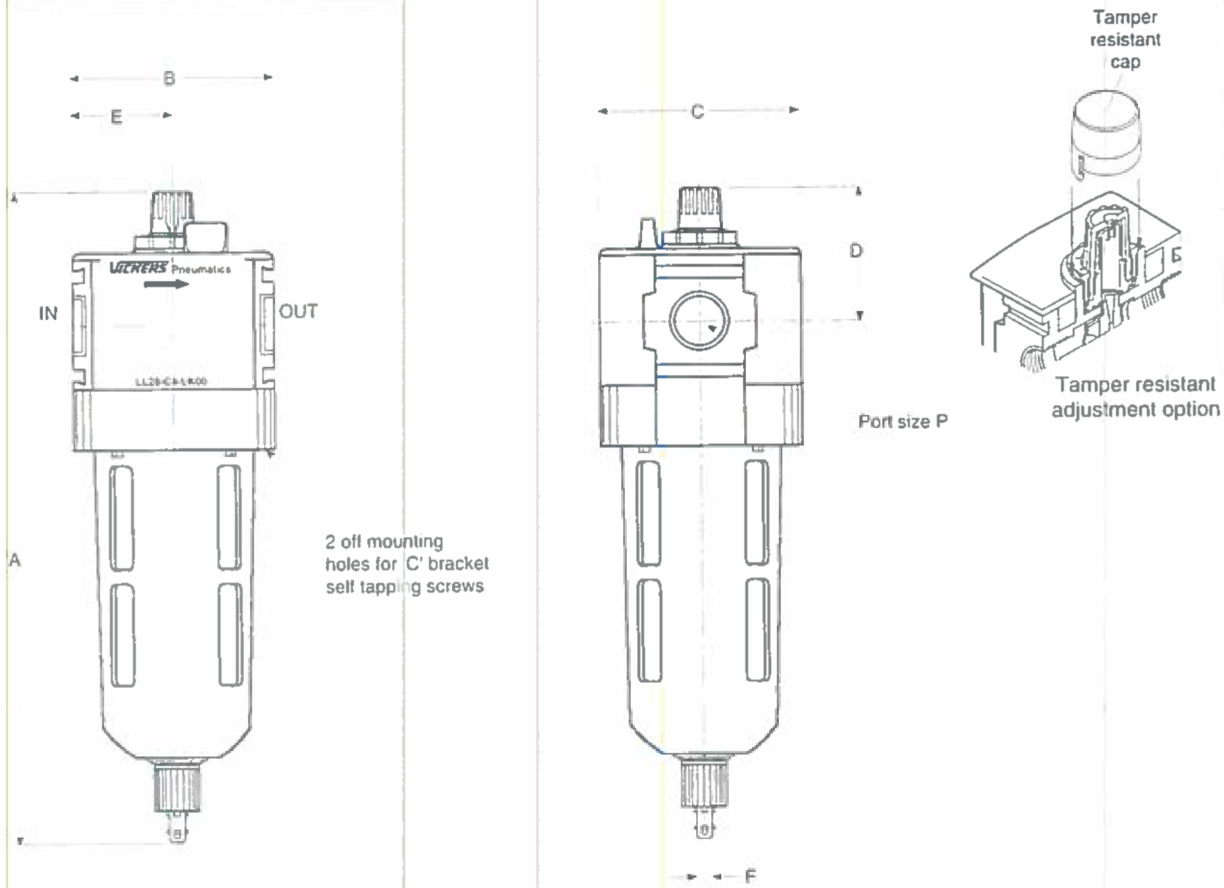


LL28-C6-LK00



Characteristics and requirements for compressed air lubricators are in accordance with ISO 6301-1, *Pneumatic fluid power - Compressed air lubricators - Part 1.*

6. Installation dimensions in mm



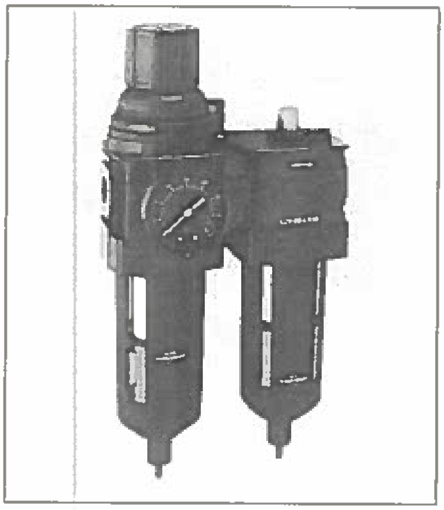
Model code	A	B	C*	D	E	F	P
LL28-C3-LK00	238	73	73	51	36	4.8mm I.D. tube barb fitting	G3/8"
LL28-C4-LK00	238	73	73	51	36	4.8mm I.D. tube barb fitting	G1/2"
LL28-C6-LK00	238	73	73	51	36	4.8mm I.D. tube barb fitting	G3/4"

* *For models with Metal Bowls dimension C = 82mm*

VICKERS

Pneumatics

Filter/Regulator, Lubricator combinations - LD28
3/8", 1/2", 3/4" BSP

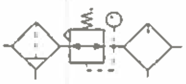


1. General description and application benefits

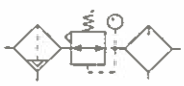
The LD28 modular combination models integrate all the unique features and advanced functions of the "28 Series" product line into a compact, lightweight and ready to mount assembly.
The units are pre-assembled utilizing modular joiner sets to facilitate easy installation and these can be fitted with 'T' brackets for wall mounting of the combination unit.

- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or modular end blocks.
- Full range of accessories.
- Self adjusting oil feed.
- Can be withdrawn from the front.

2. Functional symbol



Manual drain



Automatic drain

** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

LD28 - C * - * * * *

[1] [2] [3] [4]

[1] **Thread size**
3 = 3/8"
4 = 1/2"
6 = 3/4"

[2] **Diaphragm / Spring range**
C = Self relieving / 0 - 1.7bar
D = Self relieving / 0 - 4.2bar
F = Self relieving / 0 - 8.5bar
G = Self relieving / 0 - 17.1bar
P = Non relieving / 0 - 1.7bar
Q = Non relieving / 0 - 4.2bar
R = Non relieving / 0 - 8.5bar
S = Non relieving / 0 - 17.1bar
(Code 'F' is standard)

[3] **Bowls / Drains**
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

[4] **Options**
0 = None
C = Tamper resistant regulator adjustment
G = Pressure gauge
T = Tamper resistant lubricator adjustment
(If one option only is required use first position followed by '0'. For more than one option enter in alphabetical order)

Preferred model selection

LD28-C3-FKG0	Modular filter/regulator, lubricator combination with manual drain, 3/8"BSP
LD28-C3-FGG0	Modular filter/regulator, lubricator combination with automatic drain, 3/8"BSP
LD28-C4-FKG0	Modular filter/regulator, lubricator combination with manual drain, 1/2"BSP
LD28-C4-FGG0	Modular filter/regulator, lubricator combination with automatic drain, 1/2"BSP
LD28-C6-FKG0	Modular filter/regulator, lubricator combination with manual drain, 3/4"BSP
LD28-C6-FGG0	Modular filter/regulator, lubricator combination with automatic drain, 3/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/4"BSP, self relieving filter/regulator with 0 - 4.2bar (0 - 60psig) range spring, polycarbonate bowls with automatic drain, without pressure gauge. Order as LD28-C6-DG00

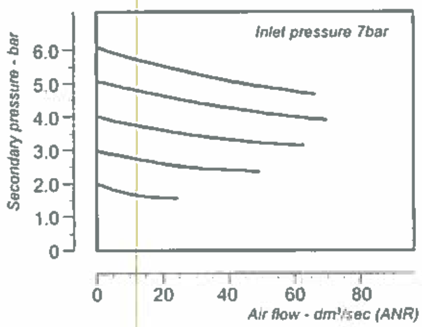
NOTE: Preferred model combinations supplied complete with centre back mounted pressure gauge.

4. Operating data

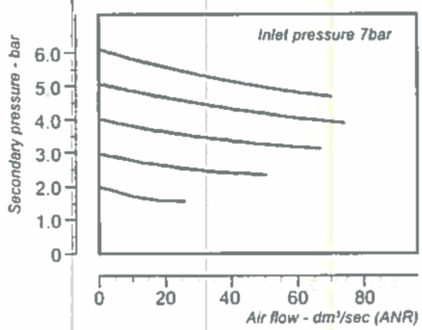
Maximum supply pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Adjustment range pressure	See filter/regulator unit - page B 3.1	
Maximum operating temperature	Polycarbonate bowl Metal bowl	52° C (125° F) 79° C (175° F)
Standard filtration	5 microns	
Retention capacity (filter)	85cm³	
Reservoir capacity (lubricator)	181cm³	
Recommended lubrication	ISO VG32	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LD28-C3-FK00 LD28-C4-FK00 LD28-C6-FK00	66.0 dm³/sec (140scfm) 74.0 dm³/sec (157scfm) 75.5 dm³/sec (160scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Gauge ports	2 x 1/4"BSP	
Materials of construction	See page F 3.1 for filter unit components See page R 3.1 for regulator unit components See page L 3.1 for lubricator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 3.1	
Accessories	See page MA 3.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 3.1	
Mass	2.10kg (4.65lb)	
Service kits	See individual units	

5. Flow characteristics

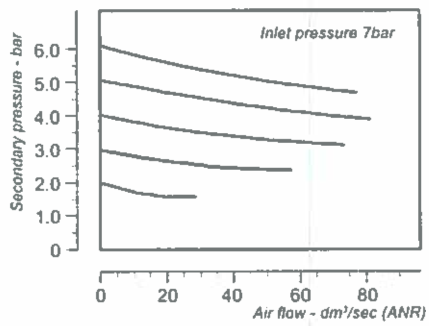
LD28-C3-FKG0



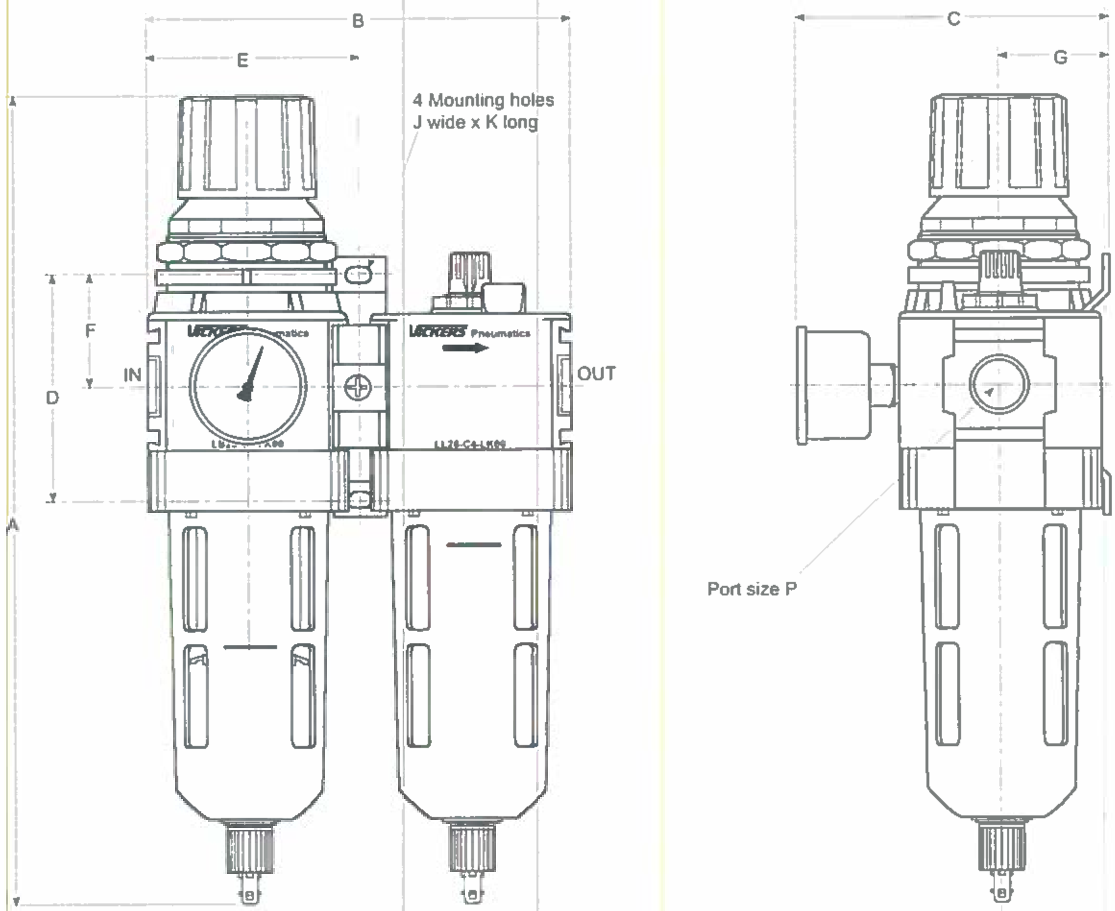
LD28-C4-FKG0



LD28-C6-FKG0



6. Installation dimensions in mm



Model code	A*	B	C	D	E	F	G	J	K	P
LD28-C3-FK00	291	155	110	83	77	41	39	7.1	14	G3/8"
LD28-C4-FK00	291	155	110	83	77	41	39	7. 1	14	G1/2"
LD28-C6-FK00	291	155	110	83	77	41	39	7.1	14	G3/4"

* *For models with Auto Drain dimension A = 282mm.*

Filter, Regulator, Lubricator combinations - LC28
3/8", 1/2", 3/4" BSP

3. Model code

LC28 - C * - * * * *

[1] [2] [3] [4]

[1] Thread size
- 3 = 3/8"
- 4 = 1/2"
- 6 = 3/4"

[2] Diaphragm / Spring range
- C = Self relieving / 0 - 1.7bar
- D = Self relieving / 0 - 4.2bar
- F = Self relieving / 0 - 8.5bar
- G = Self relieving / 0 - 17.1bar
- P = Non relieving / 0 - 1.7bar
- Q = Non relieving / 0 - 4.2bar
- R = Non relieving / 0 - 8.5bar
- S = Non relieving / 0 - 17.1bar

(Code 'F' is standard)

[3] Bowls / Drains
- G = Polycarbonate with guard / Automatic drain
- H = Metal with sight glass / Automatic drain
- K = Polycarbonate with guard / Manual drain
- L = Metal with sight glass / Manual drain

[4] Options
- 0 = None
- C = Tamper resistant regulator adjustment
- G = Pressure gauge
- T = Tamper resistant lubricator adjustment

(If one option only is required use first position followed by '0'. For more than one option enter in alphabetical order)

Preferred model selection

LC28-C3-FKG0	Modular filter, regulator, lubricator combination with manual drain, 3/8"BSP
LC28-C3-FGG0	Modular filter, regulator, lubricator combination with automatic drain, 3/8"BSP
LC28-C4-FKG0	Modular filter, regulator, lubricator combination with manual drain, 1/2"BSP
LC28-C4-FGG0	Modular filter, regulator, lubricator combination with automatic drain, 1/2"BSP
LC28-C6-FKG0	Modular filter, regulator, lubricator combination with manual drain, 3/4"BSP
LC28-C6-FGG0	Modular filter, regulator, lubricator combination with automatic drain, 3/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/8"BSP, 5 micron filter with polycarbonate bowl and manual drain, non relieving regulator with 0 - 8.5bar (0 - 125psig) range spring, without pressure gauge, lubricator with polycarbonate bowl and manual drain, tamper resistant kits fitted to regulator and lubricator. Order as LC28-C3-RKCT

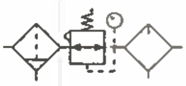
NOTE: Preferred model combinations supplied complete with centre back mounted pressure gauge.

1. General description and application benefits

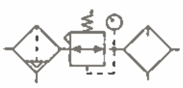
The LC28 modular combination models integrate all the unique features and advanced functions of the "28 Series" product line into a compact, lightweight and ready to mount assembly.
The units are pre-assembled utilizing modular joiner sets to facilitate easy installation and these can be fitted with 'T' brackets for wall mounting of the combination unit.

- Integral quick disconnect clear polycarbonate bowl with guard.**
- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or modular end blocks.
- Full range of accessories.
- Lubricator can be filled under pressure.**
- Can be withdrawn from the front.

2. Functional symbol



Manual drain



Automatic drain

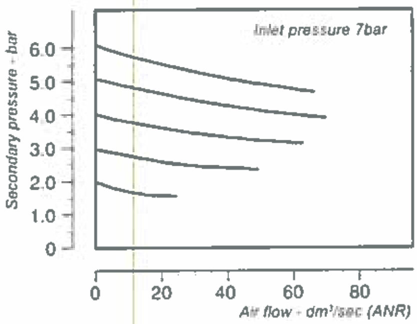
**** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.**

4. Operating data

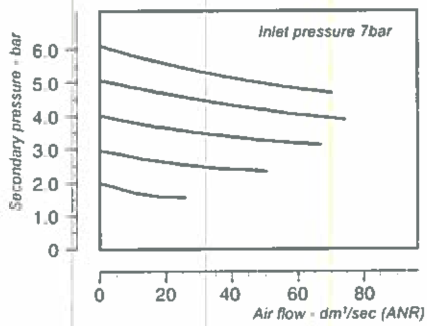
Maximum supply pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Adjustment range pressure	See regulator unit - page R 3.1	
Maximum operating temperature	Polycarbonate bowl Metal bowl	52° C (125° F) 79° C (175° F)
Standard filtration	5 microns	
Retention capacity (filter)	85cm³	
Reservoir capacity (lubricator)	181cm³	
Recommended lubrication	ISO VG32	
Maximum flow (at 7 bar inlet pressure and 6 bar secondary pressure)	LC28-C3-FK00 LC28-C4-FK00 LC28-C6-FK00	66.0 dm³/sec (140 scfm) 74.0 dm³/sec (157 scfm) 75.5 dm³/sec (160 scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Gauge ports	2 x 1/4"BSP	
Materials of construction	See page F 3.1 for filter unit components See page R 3.1 for regulator unit components See page L 3.1 for lubricator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 3.1	
Accessories	See page MA 3.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 3.1	
Mass	2.60kg (5.90lb)	
Service kits	See individual units	

5. Flow characteristics

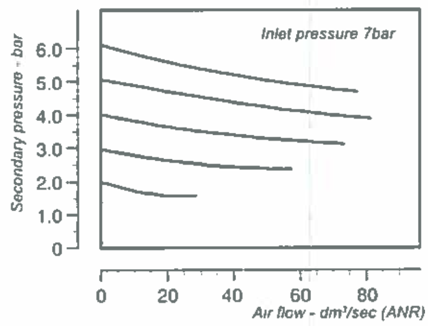
LC28-C3-FKG0



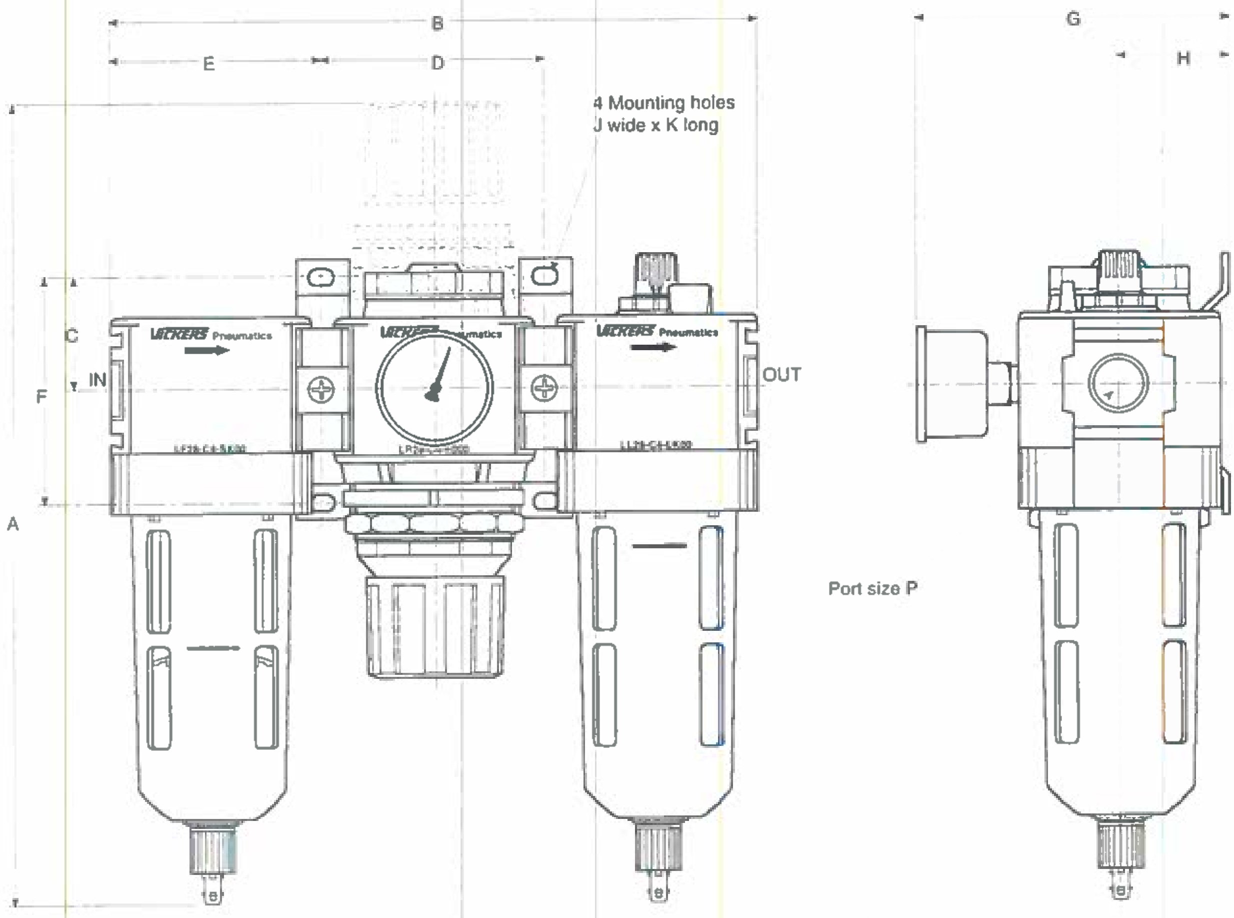
LC28-C4-FKG0



LC28-C6-FKG0



6. Installation dimensions in mm



Model code	A*	B	C	D	E	F	G	H	J	K	P
LC28-C3-FK00	292	237	41	81	77	83	110	39	7.1	14	G3/8"
LC28-C4-FK00	292	237	41	81	77	83	110	39	7.1	14	G1/2"
LC28-C6-FK00	292	237	41	81	77	83	110	39	7.1	14	G3/4"

* *With regulator in inverted position (solid lines) maximum overall height A = 238mm*

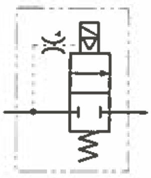
Slow start valve - LS28
3/8", 1/2", 3/4" BSP

1. General description and application benefits

The slow start valve is used in compressed air systems to control the rate of downstream pressure build up at start-up.
The slow start valve is also referred to as the "Monday Morning" valve or smooth start valve.
The slow start valve allows cylinders, valves and other pneumatically operated components to gradually move into their normal start-up position.
The design and operation of the slow start valve can reduce the possibility of equipment damage and occupational hazard to operatives **.
The normally closed slow start valves are available either internal air piloted or solenoid operated.

- High flow, high efficiency.
- Prevents shocks to systems.
- Prevents injury to users.
- No external pilot supply required.
- Adjustable time between start and operating.

2. Functional symbol



**** Conforms to EN 983 : 1994 *(Final draft)***
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L S 2 8 - C * - * 0 * *

1 2 3 4

1 **Thread size**
3 = 3/8"
4 = 1/2"
6 = 3/4"

2 **Actuator**
A = Internal air pilot
E = Solenoid (NC)

3 **Option**
0 = None

4 **Electrical voltage**
00 = None
SA = No coil (stem assembly only)
JZ = 12v DC
KZ = 24v DC
MZ = 48v DC
KY = 24v 50/60Hz AC
MY = 48v 50/60Hz AC
RY = 110/120v 50/60Hz AC
SY = 220/240V 50/60Hz AC

Preferred model selection

LS28-C3-A000	Modular slow start valve, internal air pilot operated, 3/8"BSP
LS28-C3-E0††	Modular slow start valve, solenoid operated, 3/8"BSP
LS28-C4-A000	Modular slow start valve, internal air pilot operated, 1/2"BSP
LS28-C4-E0††	Modular slow start valve, solenoid operated, 1/2"BSP
LS28-C6-A000	Modular slow start valve, internal air pilot operated, 3/4"BSP
LS28-C6-E0††	Modular slow start valve, solenoid operated, 3/4"BSP

†† = Solenoid voltage code - to be specified (see position 4 above)

Example - For 1/2"BSP, 24v DC solenoid operated slow start valve.
Order as LS28-C4-E0KZ

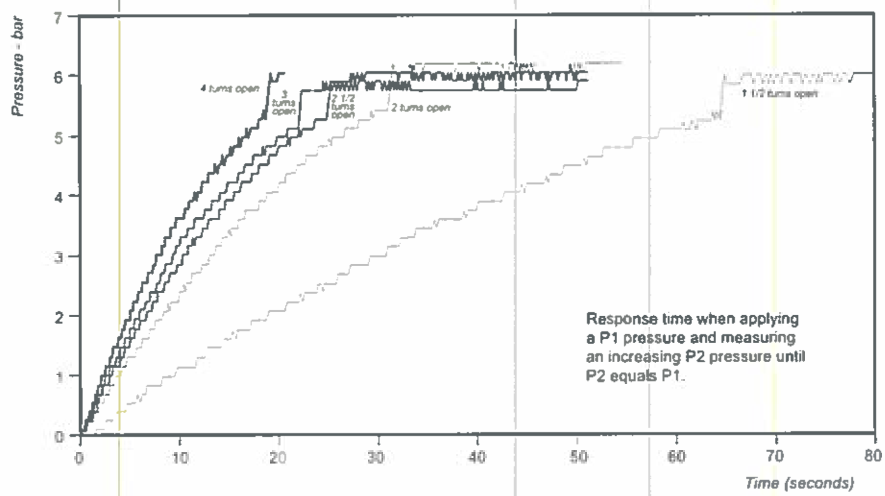
NOTE: Unit will be supplied as air operated version (LS28-C-A000) plus solenoid sub assembly (VEM22D-MO ††) for assembly by customer*

4. Operating data

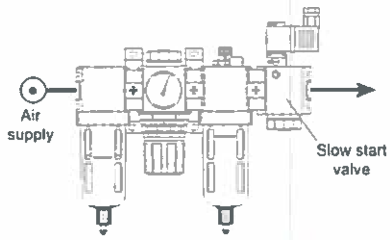
Maximum operating pressure	10bar (150psig)	
Maximum operating temperature	79°C (175°F)	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LS28-C3-A000 LS28-C4-A000 LS28-C6-A000	87.7 dm³/sec (186 scfm) 105 dm³/sec (223 scfm) 97.2 dm³/sec (206 scfm)
Performance characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Materials of construction	Body - Aluminium Bottom plug - 33% glass filled nylon Valve assembly - Brass/nitrile Springs - Stainless steel Seals - Nitrile	
Installation dimensions	See overleaf	
Mountings	See page MA 3.1	
Accessories	See page MA 3.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 3.1	
Mass	0.53kg (1.16lb)	
Service kits	Solenoid stem assembly - VEM13-126 Solenoid coil - VEM13-141††	

†† = Solenoid voltage code - to be specified (see position 4 above)

5. Performance characteristics

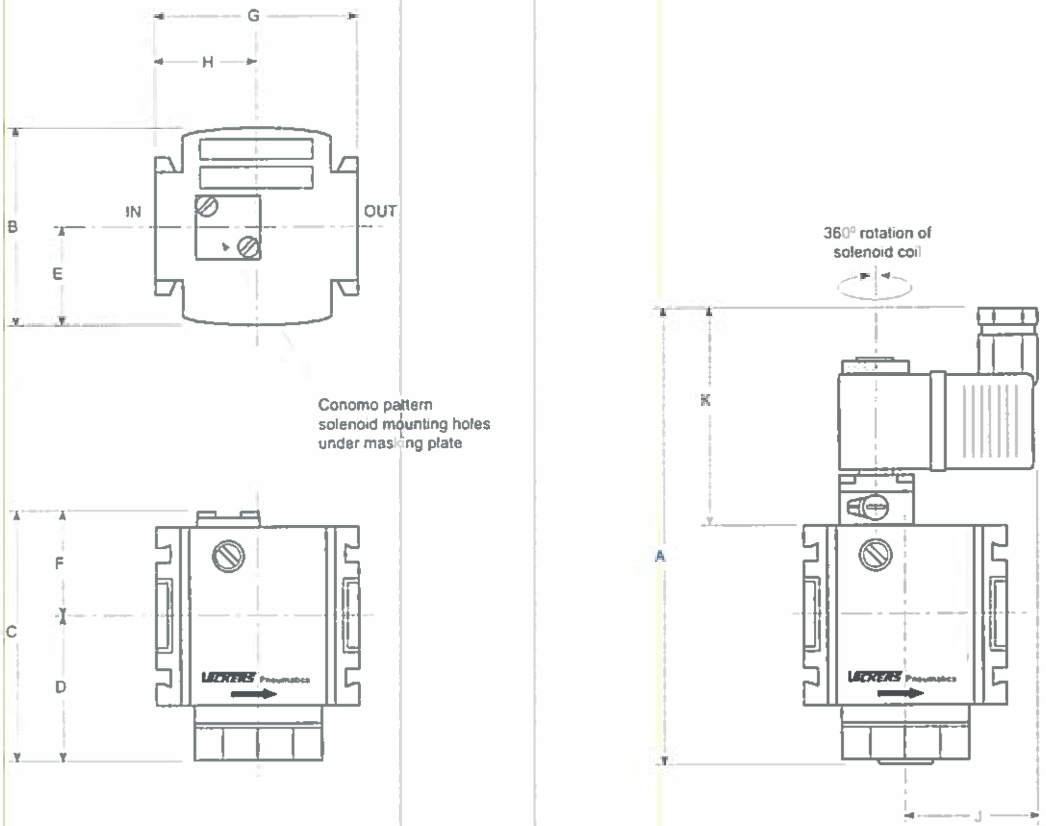


6. Typical installation



Slow start valve as part of air preparation assembly feeding an entire system

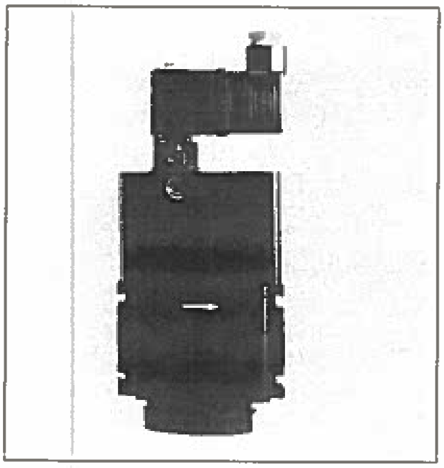
7. Installation dimensions in mm



Model code	Port size	A	B	C	D	E	F	G	H	J	K
LS28-C3-A000	G3/8"	-	73	77	45.5	36.5	31	73	36.5	-	-
LS28-C3-E0††	G3/8"	136	73	-	45.5	36.5	-	73	36.5	41	64
LS28-C4-A000	G1/2"	-	73	77	45.5	36.5	31	73	36.5	-	-
LS28-C4-E0††	G1/2"	136	73	-	45.5	36.5	-	73	36.5	41	64
LS28-C6-A000	G3/4"	-	73	77	45.5	36.5	31	73	36.5	-	-
LS28-C6-E0††	G3/4"	136	73	-	45.5	36.5	-	73	36.5	41	64

†† = Solenoid voltage code - to be specified (see position 4 on page SS 3.1)

Emergency stop valve with slow start - LE28
3/8", 1/2", 3/4" BSP

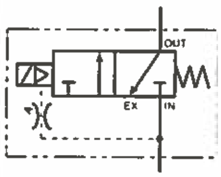


1. General description and application benefits

A unique combination of electronic on/off valve and slow start valve in a single unit.
The unique advantage of the slow start portion of the valve is that it is truly volume-independent . It is adjustable and once set the unit will maintain the same start time regardless of changes in volume, up to and including an open line on the downstream side. The design and operation of the slow start valve can reduce the possibility of equipment damage and occupational hazard to operatives **.
The unit is normally closed and in emergency stop situation exhausts on the secondary side with the primary side completely shut off. Exhaust ports are located on the rear and downstream sides of the unit.

- High flow, high efficiency.
- Adjustable time between start and operating.
- True volume independence.
- Choice of 2 exhaust ports.

2. Functional symbol



** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

LE28 - C * - * 0 * *

1 2 3 4

1 Thread size
3 = 3/8"
4 = 1/2"
6 = 3/4"

2 Actuator
E = Solenoid (NC)

3 Option
0 = None

4 Electrical voltage
SA = No coil (stem assembly only)
JZ = 12v DC
KZ = 24v DC
MZ = 48v DC
KY = 24v 50/60Hz AC
MY = 48v 50/60Hz AC
RY = 110/120v 50/60Hz AC
SY = 220/240V 50/60Hz AC

Preferred model selection

LE28-C3-E0††	Modular emergency stop/slow start valve, solenoid operated, 3/8"BSP
LE28-C4-E0††	Modular emergency stop/slow start valve, solenoid operated, 1/2"BSP
LE28-C6-E0††	Modular emergency stop/slow start valve, solenoid operated, 3/4"BSP

†† = Solenoid voltage code - to be specified (see position 4 above)

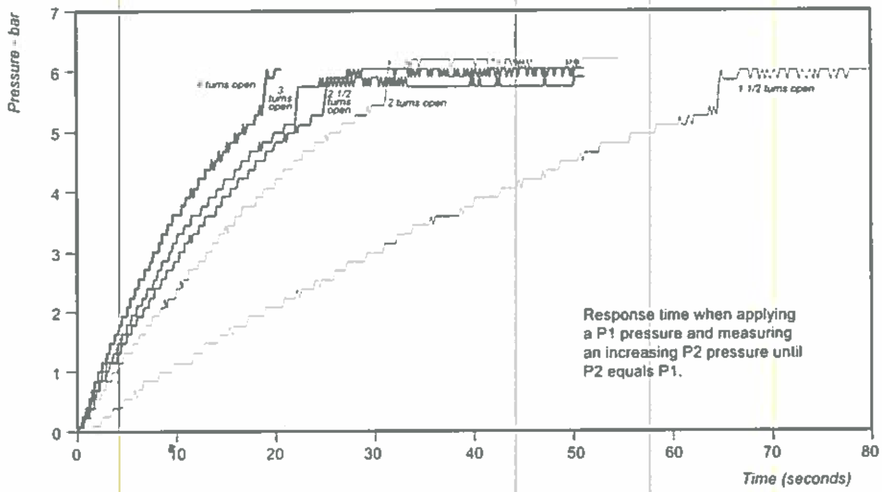
Example - For 1/2"BSP, 24v DC solenoid operated emergency stop/slow start valve. Order as LE28-C4-E0KZ

4. Operating data

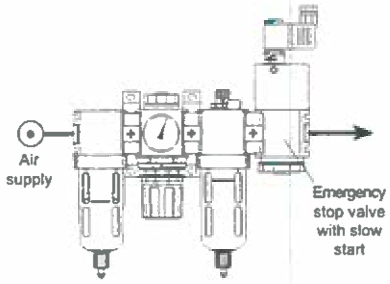
Maximum operating pressure	10bar (150psig)
Maximum operating temperature	79°C (175°F)
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LE28-C3-E000 92.5dm^3/sec (196 scfm) LE28-C4-E000 99.0dm^3/sec (210 scfm) LE28-C6-E000 108.5dm^3/sec (230 scfm)
Slow start adjustment range	1.0 to 2.0 seconds
Exhaust time	1 second maximum to commence exhaust
Exhaust flow	Kv = 43 (Cv = 3.0) minimum
Type of connection	Screwthread
Thread size	3/8", 1/2", 3/4"BSP
Materials of construction	Body - Aluminium Bottom plug - 33% glass filled nylon Valve assembly - Brass/nitrile Springs - Stainless steel Seals - Nitrile
Installation dimensions	See overleaf
Mountings	See page MA 3.1
Accessories	See page MA 3.1
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 3.1
Mass	1.14kg (2.50lb)
Service kits	Solenoid stem assembly - VEM13-126 Solenoid coil - VEM13-141††

†† = Solenoid voltage code - to be specified (see position 4 above)

5. Performance characteristics

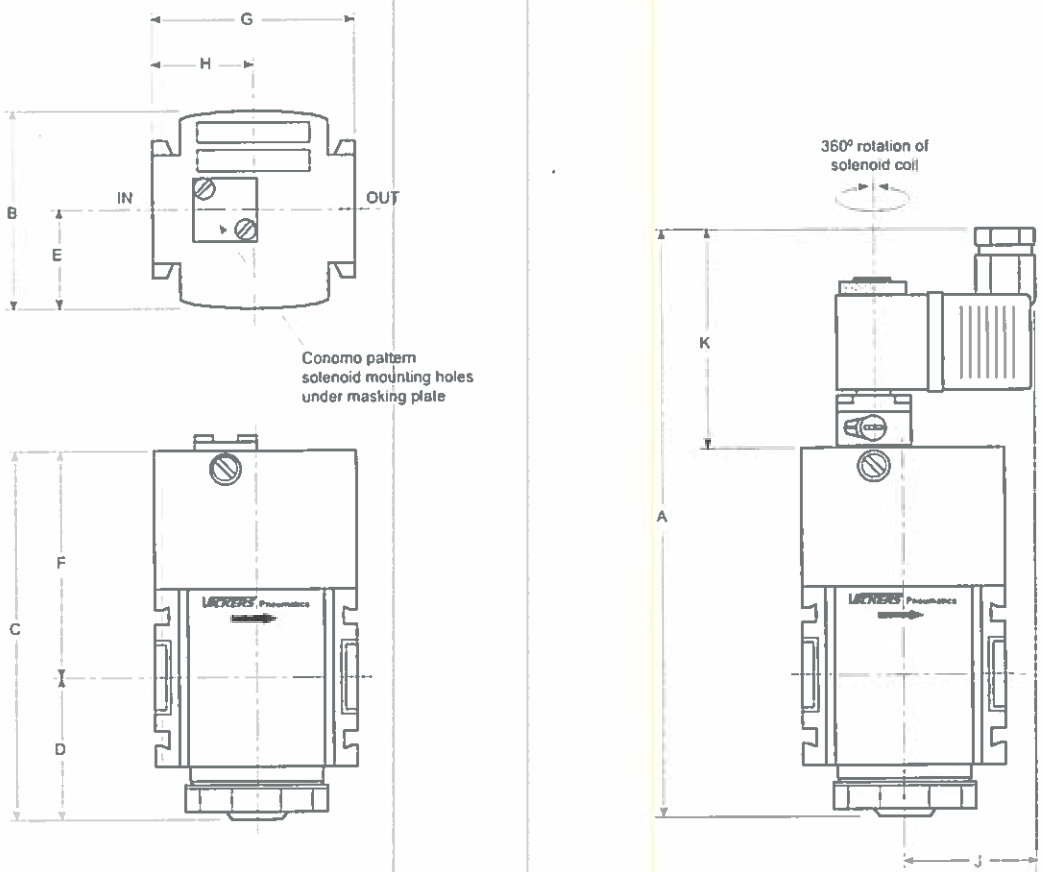


6. Typical installation



Emergency stop valve with slow start as part of air preparation assembly feeding an entire system

7. Installation dimensions in mm



Model code	Port size	A	B	C	D	E	F	G	H	J	K
LE28-C3-A000	G3/8"	-	73	122	45.5	36.5	76.5	73	36.5	-	-
LE28-C3-E0††	G3/8"	186	73	-	45.5	36.5	-	73	36.5	41	64
LE218-43-A000	G1/2"	-	73	122	45.5	36.5	76.5	73	36.5	-	-
LE28-C4-E0††	G1/2"	186	73	-	45.5	36.5	-	73	36.5	41	64
LE28-C6-A000	G3/4"	-	73	122	45.5	36.5	76.5	73	36.5	-	-
LE28-C6-E0††	G3/4"	186	73	-	45.5	36.5	-	73	36.5	41	64

†† = Solenoid voltage code - to be specified (see position 4 on page ES 3.1)

	Preferred model selection				Page numbers
	Port size	Model code	Description	Maximum flow	
Mounting accessories		J800 B810 B820	Joiner set T Bracket C Bracket		MA 4.1
Gauges		GRP-96-722 GRP-96-723	0 - 11 bar 0 - 4 bar		MA 4.1
Particle filters	G3/4" G3/4" G1" G1"	F8000-20G F8000-20G-F F8000-25G F8000-25G-F	Manual drain Auto drain Manual drain Auto drain	137 dm³/sec 137 dm³/sec 153 dm³/sec 153 dm³/sec	F 4.1 F 4.2
Coalescing filters	G3/4" G3/4" G1" G1"	M8000-20G M8000-20G-F M8000-25G M8000-25G-F	Manual drain Auto drain Manual drain Auto drain	30 dm³/sec 30 dm³/sec 30 dm³/sec 30 dm³/sec	M 4.1 M 4.2
Regulators	G3/4" G3/4" G1" G1"	R8000-20G R8000-20G-T R8000-25G R8000-25G-T	With gauge Without gauge With gauge Without gauge	232 dm³/sec 232 dm³/sec 232 dm³/sec 232 dm³/sec	R 4.1 R 4.2
Filter Regulators	G3/4" G3/4" G3/4" G3/4" G1" G1" G1" G1"	W8000-20G W8000-20G-F W8000-20G-T W8000-20G-FT W8000-25G W8000-25G-F W8000-25G-T W8000-25G-FT	Man dr + gauge Auto dr + gauge Manual drain Auto drain Man dr + gauge Auto dr + gauge Manual drain Auto drain	164 dm³/sec 164 dm³/sec 164 dm³/sec 164 dm³/sec 164 dm³/sec 164 dm³/sec 164 dm³/sec 164 dm³/sec	B 4.1 B 4.2
Lubricators	G3/4" G1"	L8000-20G L8000-25G	Without drain Without drain	134 dm³/sec 207 dm³/sec	L 4.1 L 4.2
Filter/Regulator, Lubricator combinations	G3/4" G3/4" G1" G1"	C8010-20G C8010-20G-F C8010-25G C8010-25G-F	Manual drain Auto drain Manual drain Auto drain	142 dm³/sec 142 dm³/sec 142 dm³/sec 142 dm³/sec	D 4.1 D 4.2
Filter, Regulator, Lubricator combinations	G3/4" G3/4" G1" G1"	C8000-20G C8000-20G-F C8000-25G C8000-25G-F	Manual drain Auto drain Manual drain Auto drain	142 dm³/sec 142 dm³/sec 142 dm³/sec 142 dm³/sec	C 4.1 C 4.2
Options	Metal bowls with sight glass Non relieving regulators Reverse flow regulators Low pressure springs				See relevant product pages
	Modular end blocks - 3/4",1", 1¹/₄" BSP				MA 4.1

Extract from:- EN 983:1994 ***(Final draft)*** **- Safety requirements for fluid power systems and their components - Pneumatics.**

"Scope

This standard applies to pneumatic systems and their components on machinery. It identifies hazards and factors which affect the safety of systems and their components when they are put to their intended use.

Gas bottles and receivers are excluded from the scope of this standard. For receivers see EN286-1.

The principles specified apply to the design, construction and modification of new systems and their components and aspects of use including:

- assembly, installation, adjustment, operation, cleaning and maintenance.

Components are covered in the standard, but only to the extent that safety requirements are given to allow the components to be safely integrated into the system design.

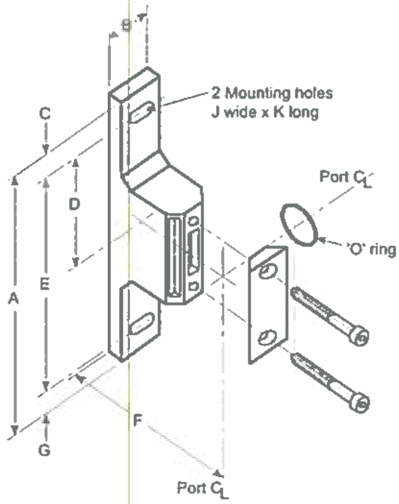
The standard applies to systems and their components on machinery that are manufactured after the date of the adoption of this standard."

Pegasus

AIR TREATMENT and CONTROL

Mountings and accessories

T Bracket

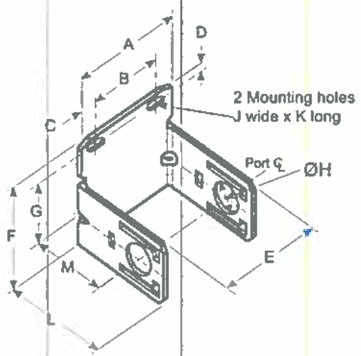


Part number	A	B	C	D	E
B810	150	27	15	50	120

F	G	J	K
65	15	9	14

C Bracket

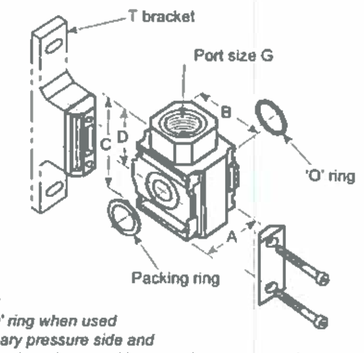
For: **F8000 series filters**
M8000 series coalescing filters
R8000, R8100 series regulators
L8000 series lubricators
W8000, W8100 series filter/regulators



Part number	A	B	C	D	E
B820	104	68	19	11	100

F	G	H	J	K	L	M
93.5	50	35	9	25	102	65

Distributor block



NOTE: Use 'O' ring when used in primary pressure side and packing ring when used in secondary pressure side.

Standard distributor block:-

Part number	A	B	C	D	G
D801-00-20G	50	81	86	53	G3/4"
D801-00-25G	50	81	86	53	G1"

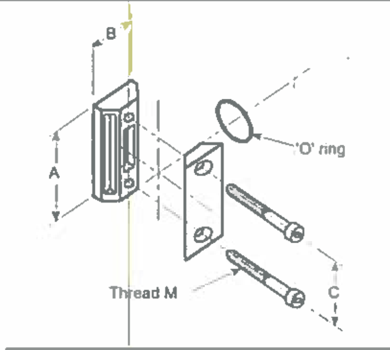
Distributor block with T bracket:-

Part number	A	B	C	D	G
D801-00-20G-B81	50	81	86	53	G3/4"
D801-00-25G-B81	50	81	86	53	G1"

Operating data

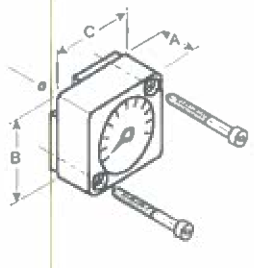
Maximum operating pressure	9.9bar (141 psig)
Maximum operating temperature	60°C (140°F)
Maximum flow D801-00-20G	330dm³/sec (700scfm)
D801-00-25G	330dm³/sec (700scfm)
Type of connection	Screwthread (off take port only)
Materials of construction	Body - Aluminium
Mass	0.35kg (0.77lb)

Joiner set



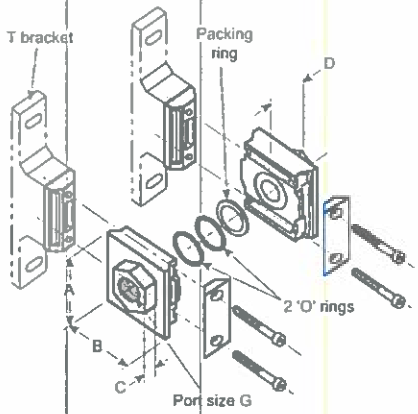
Part number	A	B	C	M
J800	65	26	50	M6

Gauge



Part number	Range	A	B	C
GRP-96-722	0 - 11bar	15	27	27
GRP-96-723	0 - 4bar	15	27	27

Piping adaptor set



NOTE: Use 'O' ring(or rings) for connections on primary pressure side and packing ring for connections on secondary pressure side.

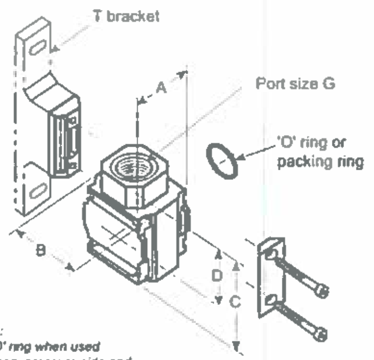
Standard piping adaptor set :-

Part number	A	B	C	D	G
A800-20G	66	81	15	35	G3/4"
A800-25G	66	81	15	35	G1"
A800-32G	66	81	18	38	G1¼"

Piping adaptor set with T bracket:-

Part number	A	B	C	D	G
A800-20G-B81	66	81	15	35	G3/4"
A800-25G-B81	66	81	15	35	G1"
A800-32G-B81	66	81	18	38	G1¼"

L shaped piping adaptor set



NOTE: Use 'O' ring when used in primary pressure side and packing ring when used in secondary pressure side.

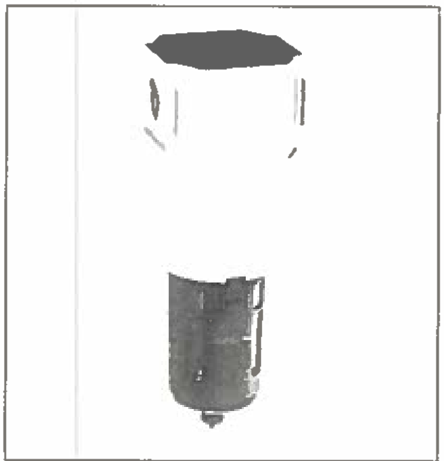
Standard L shaped adaptor set:-

Part number	A	B	C	D	G
A801-20G	50	81	86	53	G3/4"
A801-25G	50	81	86	53	G1"

L shaped adaptor set with T bracket:-

Part number	A	B	C	D	G
A801-20G-B81	50	81	86	53	G3/4"
A801-25G-B81	50	81	86	53	G1"

Particle filters - F8000
3/4", 1" BSP



1. General description and application benefits

High performance filters designed to remove solid and liquid contaminants from compressed air lines.
The F8000 filter utilizes a unique, long life, coarse to fine, reusable sintered polypropylene element (patent pending) giving superior filtration results. The element has a 40 micron outer filter and a 5 micron inner filter. A 0.3 micron disposable element is also available.
Metal bowl options, with sight glass, are available.
All filters are available with manual drain as standard or optionally with automatic mechanical drain.

- 4 times life filter element.
- Lightweight aluminium body.
- High flow, high efficiency.
- Integral quick disconnect clear polycarbonate bowl with guard. **
- Corrosion resistant nylon bowl guard with all round view slots.
- Integral body thread or port adaptors.
- Easy element replacement.

2. Functional symbols

Manual drain   Automatic drain

** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

F 8 0 0 0 - * * G - * * *

[1] (positions * *)   [2] (positions * * *)

[1] **Thread size**
20 = 3/4"
25 = 1"

[2] **Options**

Drain
- No code = Manual
- F = Automatic with manual override

Bowl
- No code = Polycarbonate with guard
- M = Metal with sight gauge

Element
- No code = 5 micron
- Y = 0.3 micron

Preferred model selection

F8000-20G	Modular particle filter with polycarbonate bowl and manual drain, 3/4"BSP
F8000-20G-F	Modular particle filter with polycarbonate bowl and automatic drain, 3/4"BSP
F8000-25G	Modular particle filter with polycarbonate bowl and manual drain, 1"BSP
F8000-25G-F	Modular particle filter with polycarbonate bowl and automatic drain, 1"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/4"BSP, particle filter with metal bowl, automatic drain and 0.3 micron element. Order as F8000-20G-FMY

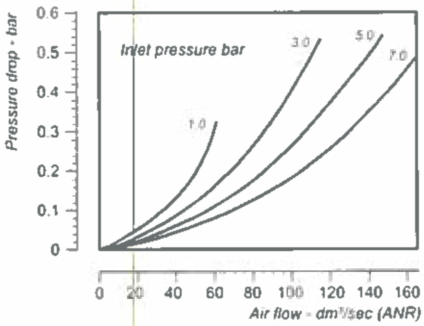
4. Operating data

Maximum operating pressure		9.9bar (141psig)
Maximum operating temperature		60°C (140°F)
Standard filtration		5 micron
Retention capacity		With manual drain - 170cm³ With automatic drain - 80cm³
Maximum flow *(at 7 bar inlet pressure and 0.3 bar pressure drop)*		F8000-20G 137dm³/sec (290scfm) F8000-25G 153dm³/sec (325scfm)
Flow characteristics		See overleaf
Type of connection		Screwthread
Thread size		3/4", 1"BSP
Materials of construction		Body - Aluminium alloy Body cap - ABS Bowl - Polycarbonate or Aluminium Bowl guard - Polyamid Element - Sintered polypropylene Seals - Nitrile
Installation dimensions		See overleaf
Mountings		See page MA 4.1
Accessories		See page MA 4.1
Port adaptors (when required)		3/4" 1", 1 " BSP - See page MA 4.1
Mass		1.16kg (2.56lb)
Service kits †	- Spare parts kit (5 micron) - Replacement element - Bowl assembly - Bowl guard - Bowl 'O' ring	F8000 - Kit (Element, baffle, bowl 'O' ring) F8000 - Element (5 micron) F8000 - Element - Y (0.3 micron) F4000 - Bowl (Manual drain) F4000 - Bowl - F (Automatic drain) F4000 - Bowl guard F4000 - 'O' ring

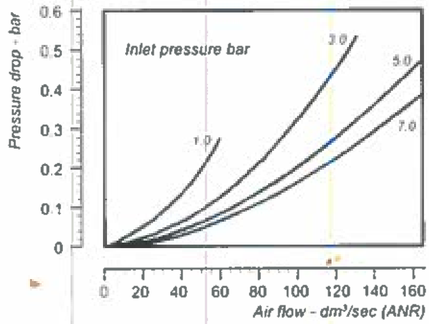
Notes: † Part numbers given are for standard units with polycarbonate bowls
- For service kits relating to other variants contact Customer Services Department

5. Flow characteristics

F8000-20G

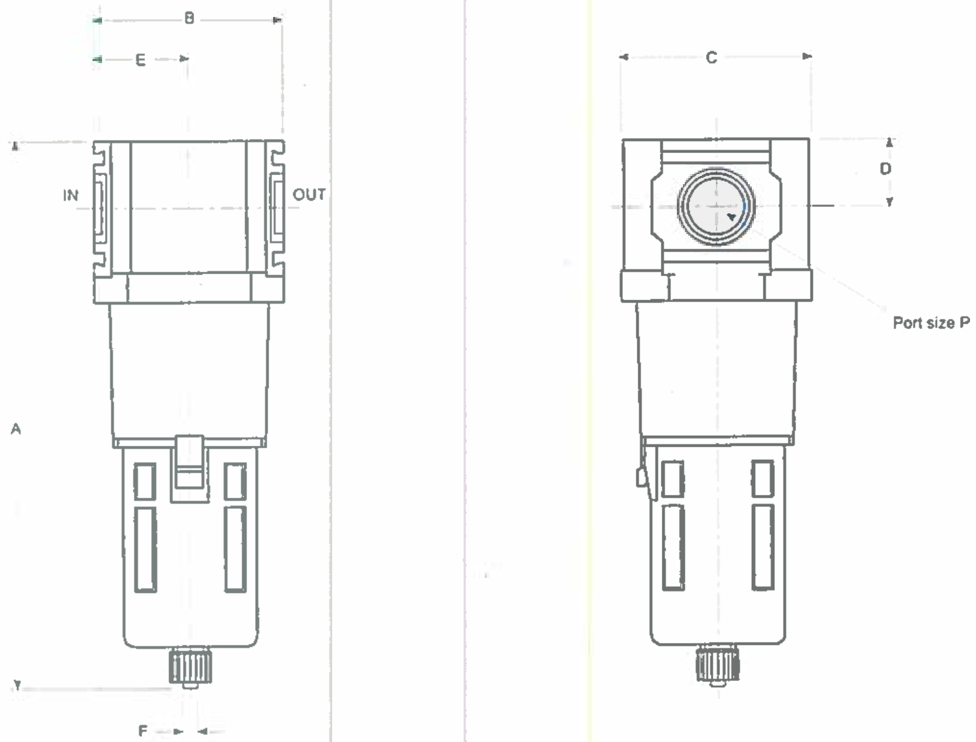


F8000-25G



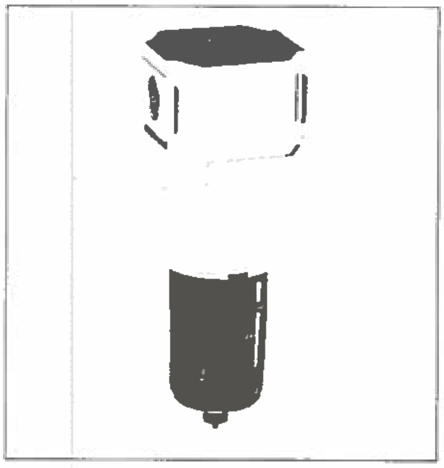
Characteristics and requirements for compressed air filters are in accordance with ISO 5782-1, *Pneumatic fluid power - Compressed air filters - Part 1.*

6. Installation dimensions in mm



Model code	A	B	C	D	E	F	P
F8000-20G	281	100	100	33	50	6mm I.D. tube barb fitting	G3/4"
F8000-25G	281	100	100	33	50	6mm I.D. tube barb fitting	G1"

Coalescing filters - M8000
3/4", 1" BSP



1. General description and application benefits

High performance coalescing filters for removal of water, oil and solid contaminants down to 0.1 ppm mg/m³.
The M8000 filters are suitable for circuits which must be oil free such as those containing measuring devices and/or instruments.
It is recommended that a F8000 standard 5 micron filter is installed upstream of the M8000 coalescing filter to maximize the service life of the coalescing filter element.
Metal bowl options, with sight glass, are available.
All filters are available with manual drain as standard or optionally with automatic mechanical drain.

- Lightweight aluminium body.
- High flow, high efficiency.
- Integral quick disconnect clear polycarbonate bowl with guard. **
- Corrosion resistant nylon bowl guard with all round view slots.
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.

2. Functional symbols

Manual drain

Automatic drain

** **Conforms to EN 983 : 1994 *(Final draft)***
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

M8000 - $\underset{\boxed{1}}{* *}$ G - $\underset{\boxed{2}}{* *}$

[1] **Thread size**
20 = 3/4"
25 = 1"

[2] **Options**
Drain
No code = Manual
F = Automatic with manual override
Bowl
No code = Polycarbonate with guard
M = Metal with sight gauge

Preferred model selection

M8000-20G	Modular coalescing filter with polycarbonate bowl and manual drain, 3/4"BSP
M8000-20G-F	Modular coalescing filter with polycarbonate bowl and automatic drain, 3/4"BSP
M8000-25G	Modular coalescing filter with polycarbonate bowl and manual drain, 1"BSP
M8000-25G-F	Modular coalescing filter with polycarbonate bowl and automatic drain, 1"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1"BSP, coalescing filter with metal bowl and manual drain.
Order as M8000-25G-M

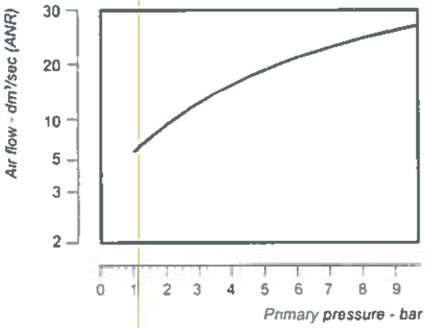
4. Operating data

Maximum operating pressure		9.9bar (141psig)
Maximum operating temperature		54°C (129°F)
Standard filtration		0.1ppm w/w at 30°C (86°F) inlet temperature
Retention capacity		With manual drain - 170cm³ With automatic drain - 80cm³
Maximum flow *(at 7 bar inlet pressure and 0.3 bar pressure drop)*		M8000-20G 30dm³/sec (64scfm) M8000-25G 30dm³/sec (64scfm)
Flow characteristics		See overleaf
Type of connection		Screwthread
Thread size		3/4", 1"BSP
Materials of construction		Body - Aluminium alloy Body cap - ABS Bowl - Polycarbonate or Aluminium Bowl guard - Polyamid Element - Borosilicate cloth Seals - Nitrile
Installation dimensions		See overleaf
Mountings		See page MA 4.1
Accessories		See page MA 4.1
Port adaptors (when required)		3/4" 1", 1 " BSP - See page MA 4.1
Mass		1.35kg (2.91lb)
Service kits†	- Spare parts kit - Replacement element - Bowl assembly - Bowl guard - Bowl 'O' ring	M8000 - Kit (Element, seal, bowl 'O' ring) M8000 - Mantle Assy F4000 - Bowl (Manual drain) F4000 - Bowl - F (Automatic drain) F4000 - Bowl guard F4000 - 'O' ring

Notes: *† Part numbers given are for standard units with polycarbonate bowls*
- For service kits relating to other variants contact Customer Services Department

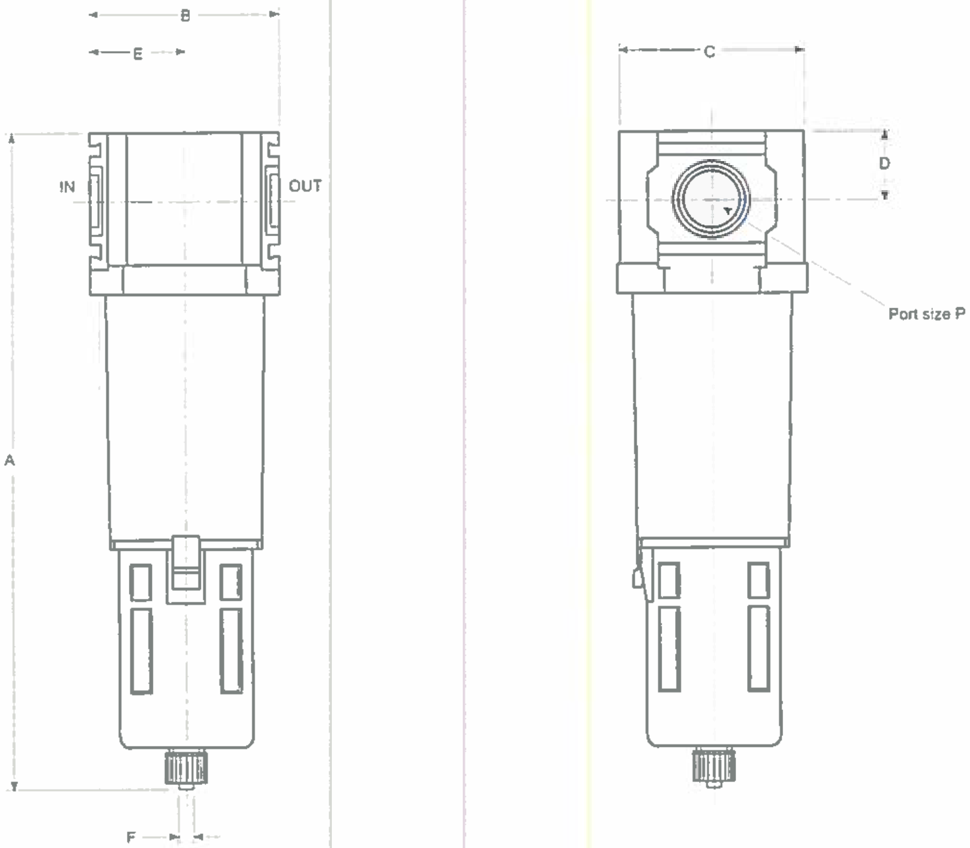
5. Flow characteristics

M8000-G**



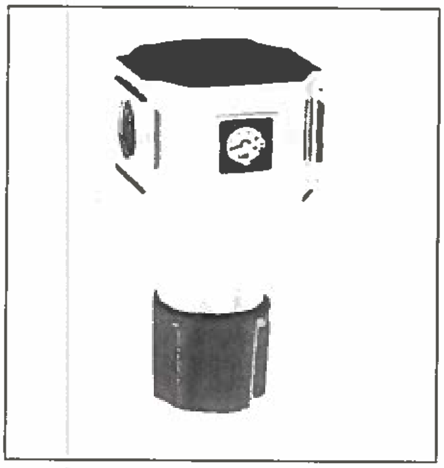
Characteristics and requirements for compressed air filters are in accordance with ISO 5782-1,
Pneumatic fluid power - Compressed air filters - Part 1.

6. Installation dimensions in mm



Model code	A	B	C	D	E	F	P
M8000-20G	334	100	100	33	50	6mm I.D. tube barb fitting	G3/4"
M8000-25G	334	100	100	33	50	6mm I.D. tube barb fitting	G1"

Regulators - R8000, R8100
3/4", 1" BSP



1. General description and application benefits

Spring loaded diaphragm type regulators featuring a balanced valve for superior regulation characteristics.
The R8000 regulators are supplied with 1 off unique built-in, flush mounted pressure gauge and 1 off 1/4"BSP gauge port adaptor as standard. If ordered without gauge, the unit is supplied with 2 off 1/4" BSP adaptors.
The standard R8000 model is self relieving with non relieving available as an option.

- Compact, lightweight modular design.
- Self relieving **
  (Non relieving option available).
- ***Unique flush mounted pressure gauge.***
- Integral body thread or port adaptors.
- Full range of accessories.
- Non rising adjustment.
- Push to lock pressure adjustment knob.
- Available with full reverse flow function.

2. Functional symbols

Self relieving | Non relieving | Reverse flow

**** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

R * * * * - * * G - * * *

[1] [2] [3]

[1] Model
8000 = Standard
8100 = Reverse flow

[2] Thread size
20 = 3/4"
25 = 1"

[3] Options

No code	=	Self relieving, with gauge, G1/4" gauge port adaptor and 0 - 8.5 bar (0 - 125 psig) spring
L	=	Low pressure spring, 0 - 4 bar (0 - 60 psig)
N	=	Non relieving type
T	=	Without pressure gauge - fitted with 2 off G1/4" gauge port adaptors.

Preferred model selection

R8000-20G	Modular regulator with gauge and 0 - 8.5bar (0-125psig) spring, 3/4"BSP
R8000-20G-T	Modular regulator, without gauge, with 0 - 8.5bar (0-125psig) spring, 3/4"BSP
R8000-25G	Modular regulator with gauge and 0 - 8.5bar (0-125psig) spring, 1"BSP
R8000-25G-T	Modular regulator without gauge, with 0 - 8.5bar (0-125psig) spring, 1"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/4"BSP, non relieving reverse flow regulator with low pressure spring and without gauge. Order as R8100-20G-LNT

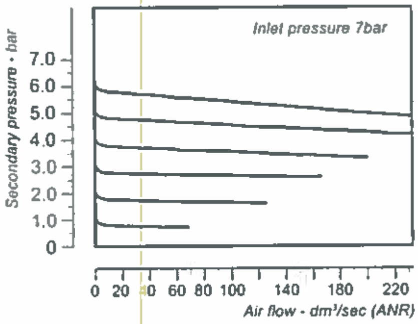
NOTE: For unit without pressure gauge order gauge separately - see page PG 1.1

4. Operating data

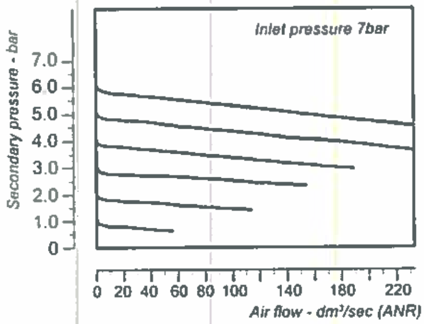
Maximum supply pressure	9.9 bar (141 psig)	
Adjustment range pressure	0.5 - 8.5 bar (7.1 - 121psig)	
Maximum operating temperature	60° C (140° F)	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	R8000-20G R8000-25G	232 dm³/sec (491scfm) 232 dm³/sec (491scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/4", 1"BSP	
Gauge port(s)	1/4"BSP	
Materials of construction	Body - Aluminium alloy Body cap - ABS Knob and panel nut - Acetal Bonnet -Aluminium alloy Diaphragm assembly - Nitrile/zinc Springs - Steel Seals - Nitrile	
Installation dimensions	See overleaf	
Mountings	See page MA 4.1	
Accessories	See page MA 4.1	
Port adaptors (when required)	3/4" 1", 1 " BSP - See page MA 4.1	
Mass	1.60kg (3.53lb)	
Service kits - Spare parts kit - Diaphragm assembly - Valve assembly kit - Pressure springs (0 - 4.0 bar) (0 - 8.5bar)	R8000-Kit (Diaphragm assy, valve assy) R8000 - Diaphragm assy (Self relieving) R8000 - Valve assy R8000 - Spring - L R8000 - Spring	

5. Flow characteristics

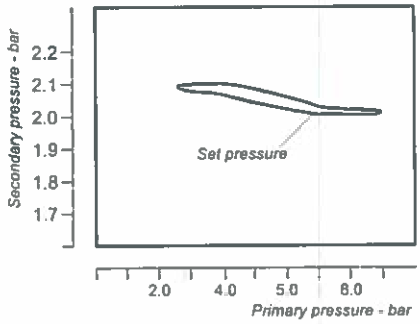
R8000-20G



R8000-25G

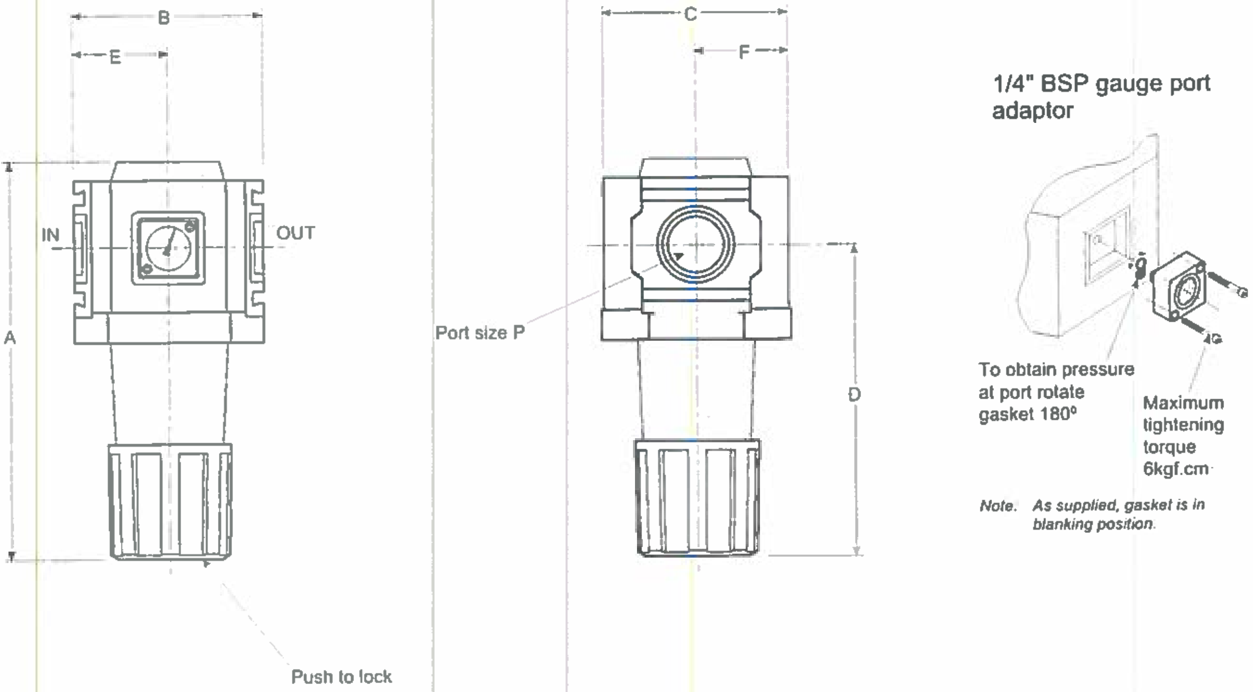


6. Pressure characteristics



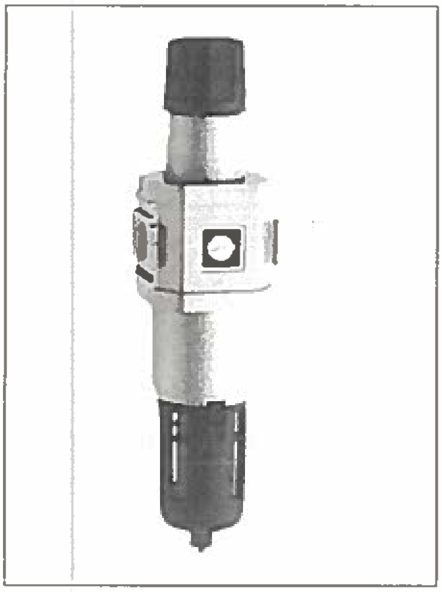
Characteristics and requirements for air line pressure regulators are in accordance with ISO 6953-1, *Pneumatic fluid power air line pressure regulators - Part 1.*

7. Installation dimensions in mm



Model code	A	B	C	D	E	F	P
R8000-20G	199	100	100	159	50	50	G3/4"
R8000-25G	199	100	100	159	50	50	G1"

Filter / Regulators - W8000, W8100
3/4", 1" BSP

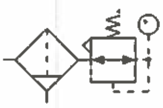


1. General description and application benefits

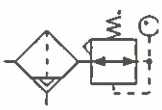
The integral Filter/Regulator air set combines all the advanced features and functions of the standard filter and regulator into a high performance unit. The W8000 models can be used where space and lower costs are required.

- Lightweight, compact modular design.
- High flow, high efficiency.
- Self relieving **
  (Non relieving option available).
- ***Unique flush mounted pressure gauge.***
- Integral quick disconnect clear polycarbonate bowl with guard.
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbol



Manual drain



Automatic drain

**** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

W * * * * - * * G - * * * *

[1] [2] [3]

[1] Model
8000 = Standard
8100 = Reverse flow

[2] Thread size
20 = 3/4"
25 = 1"

[3] Options

Drain
- No code = Manual
- F = Automatic with manual override

Bowl
- No code = Polycarbonate with guard
- M = Metal with sight gauge

Element
- No code = 5 micron
- Y = 0.3 micron

Regulator
- No code = Self relieving, with gauge, G1/4" gauge port adaptor and 0 - 8.5 bar (0 - 125 psig) spring
- L = Low pressure spring, 0 - 4 bar (0 - 60 psig)
- N = Non relieving type
- T = Without pressure gauge - fitted with 2 off G1/4" gauge port adaptors.

Preferred model selection

W8000-20G	Modular self relieving filter/regulator c/w gauge, manual drain & poly bowl, 3/4"BSP
W8000-20G-F	Modular self relieving filter/regulator c/w gauge, automatic drain & poly bowl, 3/4"BSP
W8000-20G-T	Modular self relieving filter/regulator c/w manual drain & poly bowl, 3/4"BSP
W8000-20G-FT	Modular self relieving filter/regulator c/w automatic drain & poly bowl, 3/4"BSP
W8000-25G	Modular self relieving filter/regulator c/w gauge, manual drain & poly bowl, 1"BSP
W8000-25G-F	Modular self relieving filter/regulator c/w gauge, automatic drain & poly bowl, 1"BSP
W8000-25G-T	Modular self relieving filter/regulator c/w manual drain & poly bowl, 1"BSP
W8000-25G-FT	Modular self relieving filter/regulator c/w automatic drain & poly bowl, 1"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1"BSP, non relieving reverse flow regulator and fitted with metal bowl and automatic drain. Order as W8100-25G-FMN

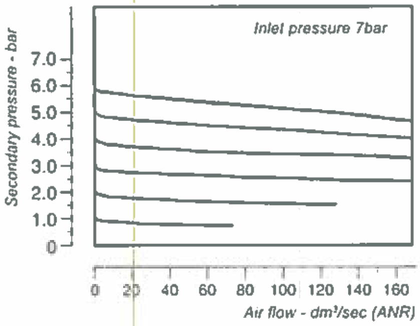
NOTE: For unit without pressure gauge order gauge separately - see page PG 1.1

4. Operating data

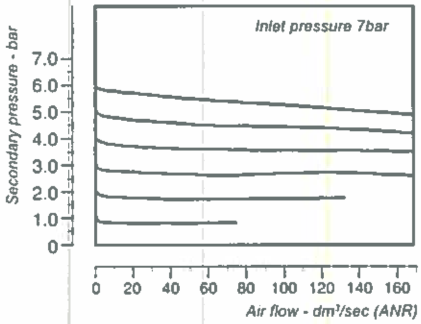
Maximum supply pressure	9.9bar (141psig)	
Adjustment range pressure	0.5 - 8.5bar (7.1 - 120psig)	
Maximum operating temperature	60° C (140° F)	
Standard filtration	5 microns	
Retention capacity	With manual drain - 170cm³ With automatic drain - 80cm³	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	W8000-20G W8000-25G	164dm³/sec (348scfm) 164dm³/sec (348scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/4", 1"BSP	
Gauge port(s)	1/4"BSP	
Materials of construction	See page F 4.1 for filter unit components See page R 4.1 for regulator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 4.1	
Accessories	See page MA 4.1	
Port adaptors (when required)	3/4", 1", 1 " BSP - See page MA 4.1	
Mass	2.00kg (4.41lb)	
Service kits	See page F 4.1 for filter unit components See page R 4.1 for regulator unit components	

5. Flow characteristics

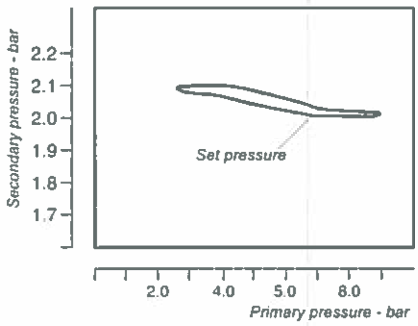
W8000-20G



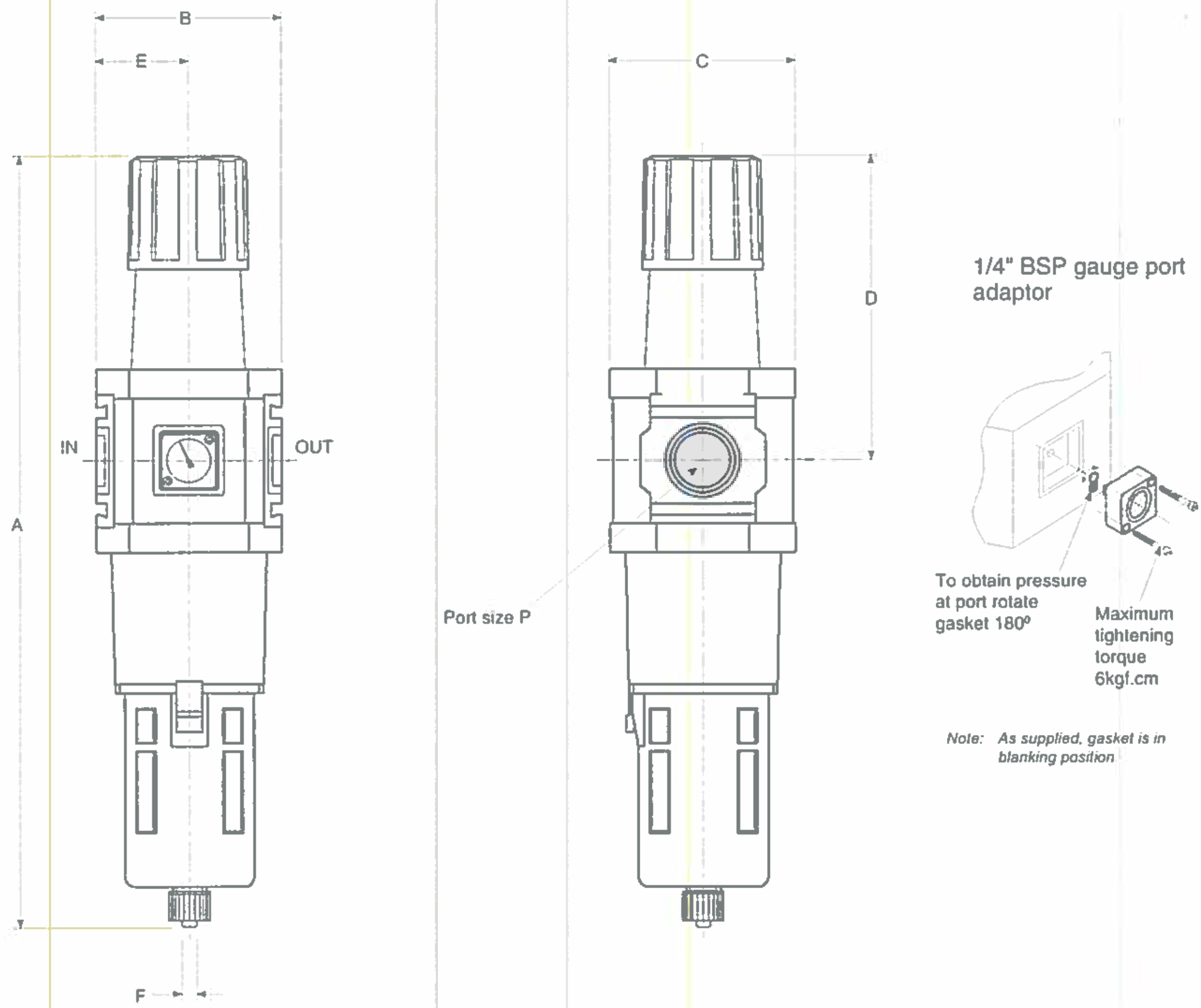
W8000-25G



6. Pressure characteristics

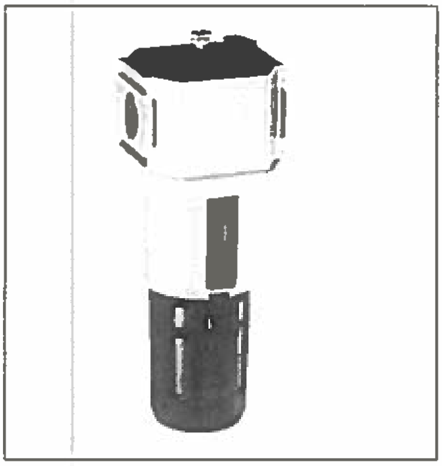


7. Installation dimensions in mm



Model code	A	B	C	D	E	F	P
W8000-20G	407	100	100	159	50	6mm I.D. tube barb fitting	G3/4"
W8000-25G	407	100	100	159	50	6mm I.D. tube barb fitting	G1"

Lubricators - L8000
3/4", 1" BSP



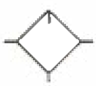
1. General description and application benefits

The L8000 series lubricator injects an oil mist into the flowing air stream of a pneumatic circuit to automatically provide the proper internal lubrication for air operated tools and other air operated devices.
The precise amount of oil to be delivered to the air stream is determined by the integral adjusting knob needle valve which sets the exact oil drip rate and can be adjusted without tools.

A feature of the L8000 series lubricator is that it can be refilled with the unit under pressure. **

- Self adjusting oil feed
- High flow, high efficiency.
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Integral body thread or port adaptors.
- Full range of accessories.
- Integrated sight dome and adjusting screw with drip scale.
- Oil back flow prevention.

2. Functional symbol



** Conforms to EN 983 : 1994 *(Final draft)* **Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

L 8 0 0 0 - * * G - * *

(1) under first * *, (2) under last * *

[1] **Thread size**
20 = 3/4"
25 = 1"

[2] **Options**
Drain
- No code = Without drain cock
- C = With manual drain cock

Bowl
- No code = Polycarbonate with guard
- M = Metal with sight gauge

Preferred model selection

L8000-20G	Modular lubricator with polycarbonate bowl without drain, 3/4"BSP
L8000-25G	Modular lubricator with polycarbonate bowl without drain, 1"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/4"BSP, lubricator with metal bowl and manual drain.
Order as L8000-20G-CM

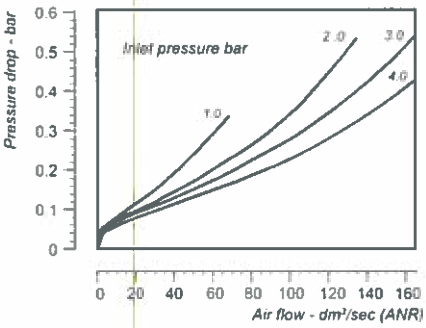
4. Operating data

Maximum operating pressure	9.9 bar (141psig)	
Maximum operating temperature	60°C (140°F)	
Reservoir capacity	170cm^3	
Recommended lubrication	ISO VG32	
Maximum flow *(at 7bar inlet pressure and 0.3 bar pressure drop)*	L8000-20G L8000-25G	134dm^3/sec (285scfm) 207dm^3/sec (440scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/4", 1"BSP	
Materials of construction	Body - Aluminium alloy Body cap - ABS Bowl - Polycarbonate or Aluminium Bowl guard - Polyamid Sight dome - Polycarbonate Seals - Nitrile	
Installation dimensions	See overleaf	
Mountings	See page MA 4.1	
Accessories	See page MA 4.1	
Port adaptors (when required)	3/4" 1", 1 " BSP - See page MA 4.1	
Mass	1.40kg (3.09lb)	
Service kits† - Spare parts kit	L8000 - Kit (Fill plug 'O' ring, adjusting set, flow guide set, bowl 'O' ring)	
- Bowl	L4000 - Bowl	
- Bowl guard	L4000 - Bowl guard	
- Bowl 'O' ring	F4000 - 'O' ring	
- Flow guide set	L8000 - Flow guide	
- Fill plug set	L3000 - Plug (Plug, 'O' ring)	

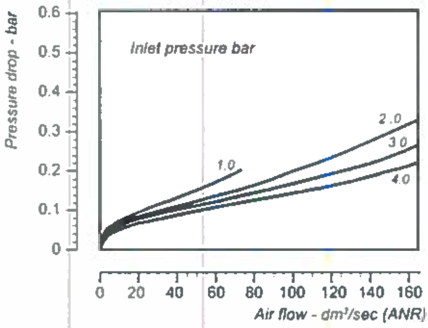
Notes: † Part numbers given are for standard units with polycarbonate bowls
- For service kits relating to other variants contact Customer Services Department

5. Flow characteristics

L8000-20G

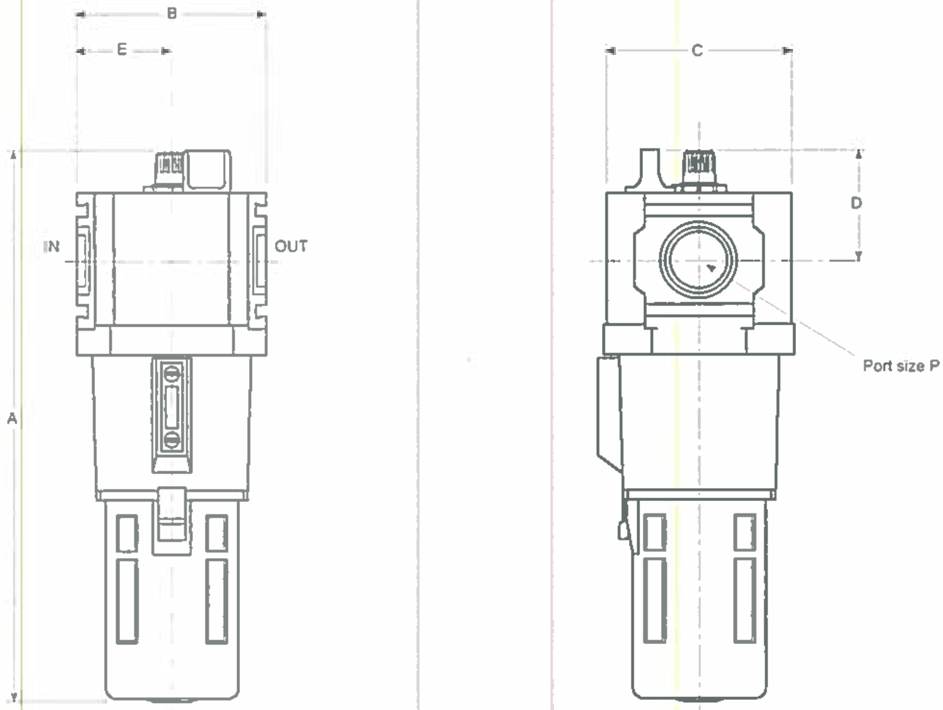


L8000-25G



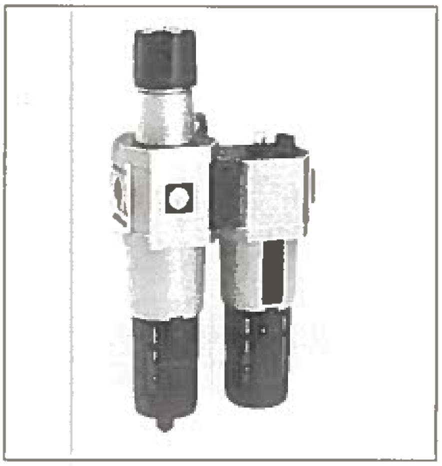
Characteristics and requirements for compressed air lubricators are in accordance with ISO 6301-1, *Pneumatic fluid power - Compressed air lubricators - Part 1.*

6. Installation dimensions in mm



Model code	A	B	C	D	E	P
L8000-20G	280	100	100	54	50	G3/4"
L8000-25G	280	100	100	54	50	G1"

Filter/Regulator, Lubricator combinations - C8010
3/4", 1" BSP

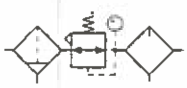


1. General description and application benefits

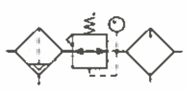
The C8010 modular combination models integrate all the unique features and advanced functions of the "8000 Series" product line into a compact, lightweight and ready to mount assembly.
The units are pre-assembled utilizing modular joiner sets to facilitate easy installation and these are fitted with 'T' brackets for wall mounting of the combination unit.

- Integral quick disconnect clear polycarbonate bowl with guard. **
- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or modular end blocks.
- Full range of accessories.
- Lubricator can be filled under pressure.
- Can be withdrawn from the front.

2. Functional symbol



Manual drain



Automatic drain

**** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

C 8 0 1 0 - * * G - * * *
[1] [2]

[1] **Thread size**
20 = 3/4"
25 = 1"

[2] **Options**

Drain
- No code = Filter Regulator - Manual, Lubricator - None
- C = Lubricator with manual drain cock
- F = Filter Regulator - Automatic with manual override

Bowl
- No code = Polycarbonate with guard
- M = Metal with sight gauge

Element
- No code = 5 micron
- Y = 0.3 micron

Regulator
- No code = Self relieving, with gauge, G1/4" gauge port adaptor and 0 - 8.5 bar (0 - 125 psig) spring
- L = Low pressure spring, 0 - 4 bar (0 - 60 psig)
- N = Non relieving type
- T = Without pressure gauge - fitted with 2 off G1/4" gauge port adaptors.

Preferred model selection

C8010-20G	Modular FR/L combination c/w gauge, manual drain(FR) & poly bowls, 3/4"BSP
C8010-20G-F	Modular FR/L combination c/w gauge, automatic drain(FR) & poly bowls, 3/4"BSP
C8010-25G	Modular FR/L combination c/w gauge, manual drain(FR) & poly bowls, 1"BSP
C8010-25G-F	Modular FR/L combination c/w gauge, automatic drain(FR) & poly bowls, 1"BSP

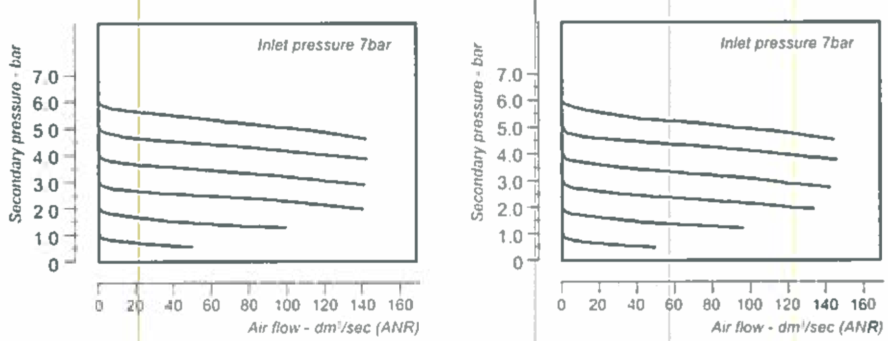
To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1" BSP,self relieving regulator with pressure gauge, metal bowls with sight gauge and automatic drain to filter/regulator and manual drain to lubricator. Order as C8010-25G-CFM

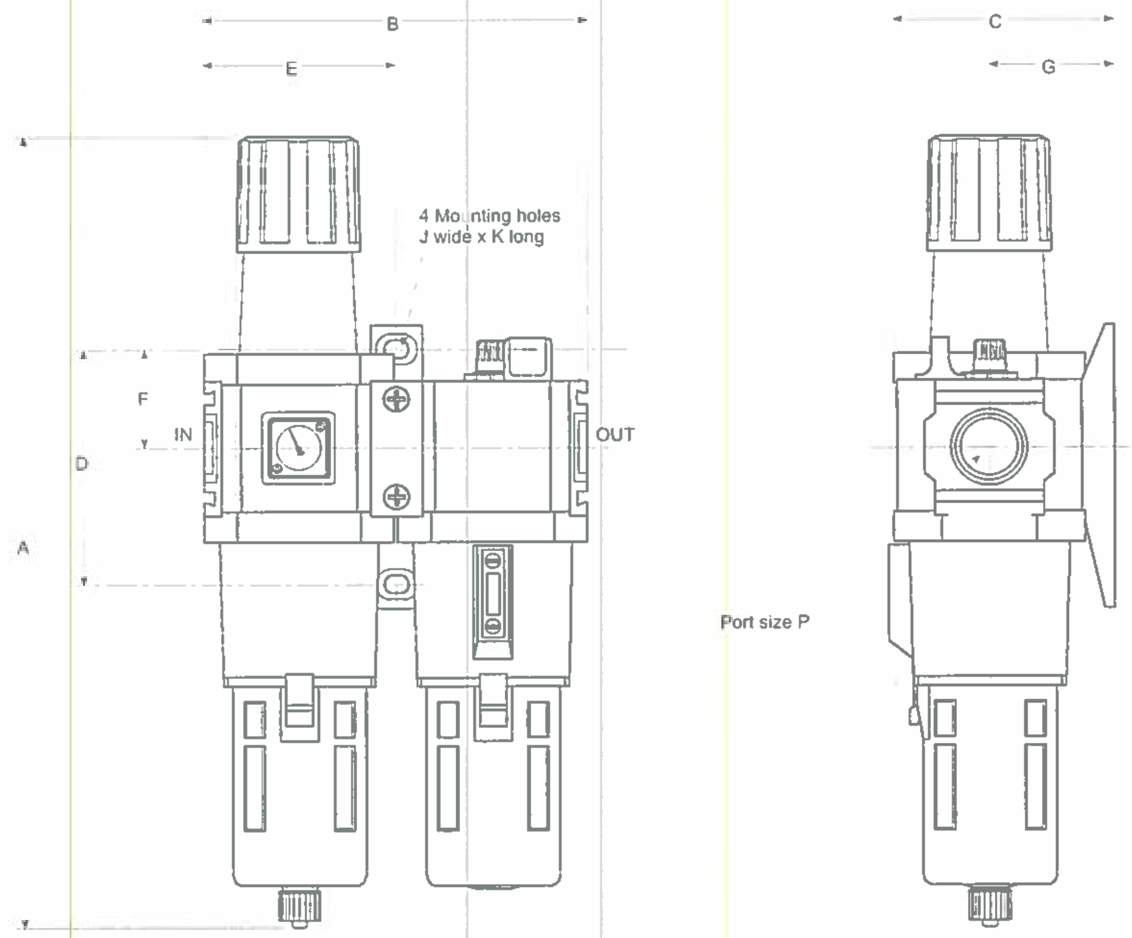
4. Operating data

Maximum supply pressure	9.9bar (141psig)	
Adjustment range pressure	0.5 - 8.5bar (7.1 - 120psig)	
Maximum operating temperature	60° C (140° F)	
Standard filtration	5 microns	
Retention capacity (filter)	With manual drain - 170cm³ With automatic drain - 80cm³	
Reservoir capacity (lubricator)	170cm³	
Recommended lubrication	ISO VG32	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	C8010-20G C8010-25G	142dm³/sec (302scfm) 142dm³/sec (302scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/4", 1"BSP	
Gauge port(s)	1/4"BSP	
Materials of construction	See page F 4.1 for filter unit components See page R 4.1 for regulator unit components See page L 4.1 for lubricator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 4.1	
Accessories	See page MA 4.1	
Port adaptors (when required)	3/4", 1", 1 " BSP - See page MA 4.1	
Mass	3.52kg (7.76lb)	
Service kits	See individual units	

5. Flow characteristics

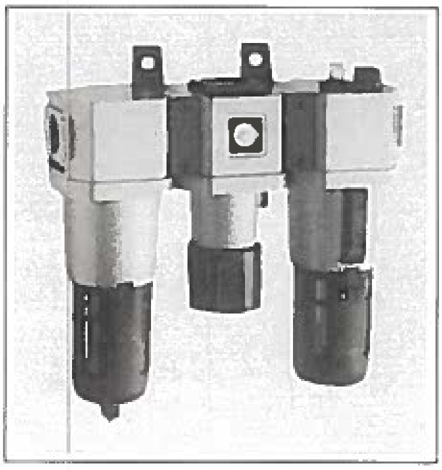


6. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	J	K	P
C8010-20G	407	200	115	120	50	50	65	9	14	G3/4"
C8010-25G	407	200	115	120	50	50	65	9	14	G1"

Filter, Regulator, Lubricator combinations - C8000
3/4", 1" BSP

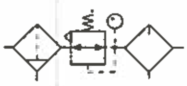


1. General description and application benefits

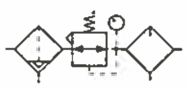
The C8000 modular combination models integrate all the unique features and advanced functions of the "8000 Series" product line into a compact, lightweight and ready to mount assembly.
The units are pre-assembled utilizing modular joiner sets to facilitate easy installation and these are fitted with 'T' brackets for wall mounting of the combination unit.

- Integral quick disconnect clear polycarbonate bowl with guard. **
- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or modular end blocks.
- Full range of accessories.
- Lubricator can be filled under pressure.
- Can be withdrawn from the front.

2. Functional symbol



Manual drain



Automatic drain

**** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

C8000 - * * G - * * *

[1] (under * *) [2] (under * * *)

[1] Thread size
20 = 3/4"
25 = 1"

[2] Options

Drain
- No code = Filter - Manual, Lubricator - None
- C = Lubricator with manual drain cock
- F = Filter -Automatic with manual override

Bowl
- No code = Polycarbonate with guard
- M = Metal with sight gauge

Element
- No code = 5 micron
- Y = 0.3 micron

Regulator
- No code = Self relieving, with gauge, G1/4" gauge port adaptor and 0 - 8.5 bar (0 - 125 psig) spring
- L = Low pressure spring, 0 - 4 bar (0 - 60 psig)
- N = Non relieving type
- T = Without pressure gauge - fitted with 2 off G1/4" gauge port adaptors.

Preferred model selection

C8000-20G	Modular F/R/L combination c/w gauge, manual drain(F) & poly bowls, 3/4"BSP
C8000-20G-F	Modular F/R/L combination c/w gauge, automatic drain(F) & poly bowls, 3/4"BSP
C8000-25G	Modular F/R/L combination c/w gauge, manual drain(F) & poly bowls, 1"BSP
C8000-25G-F	Modular F/R/L combination c/w gauge, automatic drain(F) & poly bowls, 1"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

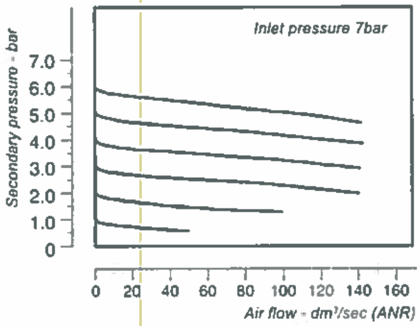
Example - For 3/4"BSP, 5 micron with polycarbonate bowl and manual drain, non relieving regulator without pressure gauge and lubricator with polycarbonate bowl and manual drain. Order as C8000-20G-CNT

4. Operating data

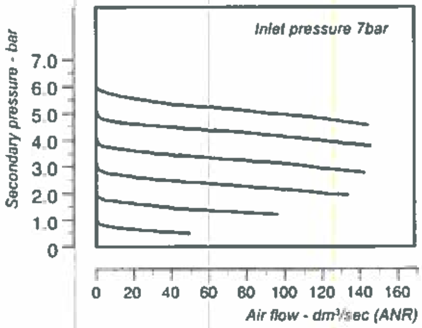
Maximum supply pressure	9.9bar (141psig)
Adjustment range pressure	0.5 - 8.5bar (7.1 - 120psig)
Maximum operating temperature	60° C (140° F)
Standard filtration	5 microns
Retention capacity (filter)	With manual drain - 170cm³ With automatic drain - 80cm³
Reservoir capacity (lubricator)	170cm³
Recommended lubrication	ISO VG32
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	C8000-20G 142dm³/sec (302scfm) C8000-25G 142dm³/sec (302scfm)
Flow characteristics	See overleaf
Type of connection	Screwthread
Thread size	3/4", 1"BSP
Gauge port(s)	1/4"BSP
Materials of construction	See page F 4.1 for filter unit components See page R 4.1 for regulator unit components See page L 4.1 for lubricator unit components
Installation dimensions	See overleaf
Mountings	See page MA 4.1
Accessories	See page MA 4.1
Port adaptors (when required)	3/4", 1", 1 " BSP - See page MA 4.1
Mass	4.40kg (9.70lb)
Service kits	See individual units

5. Flow characteristics

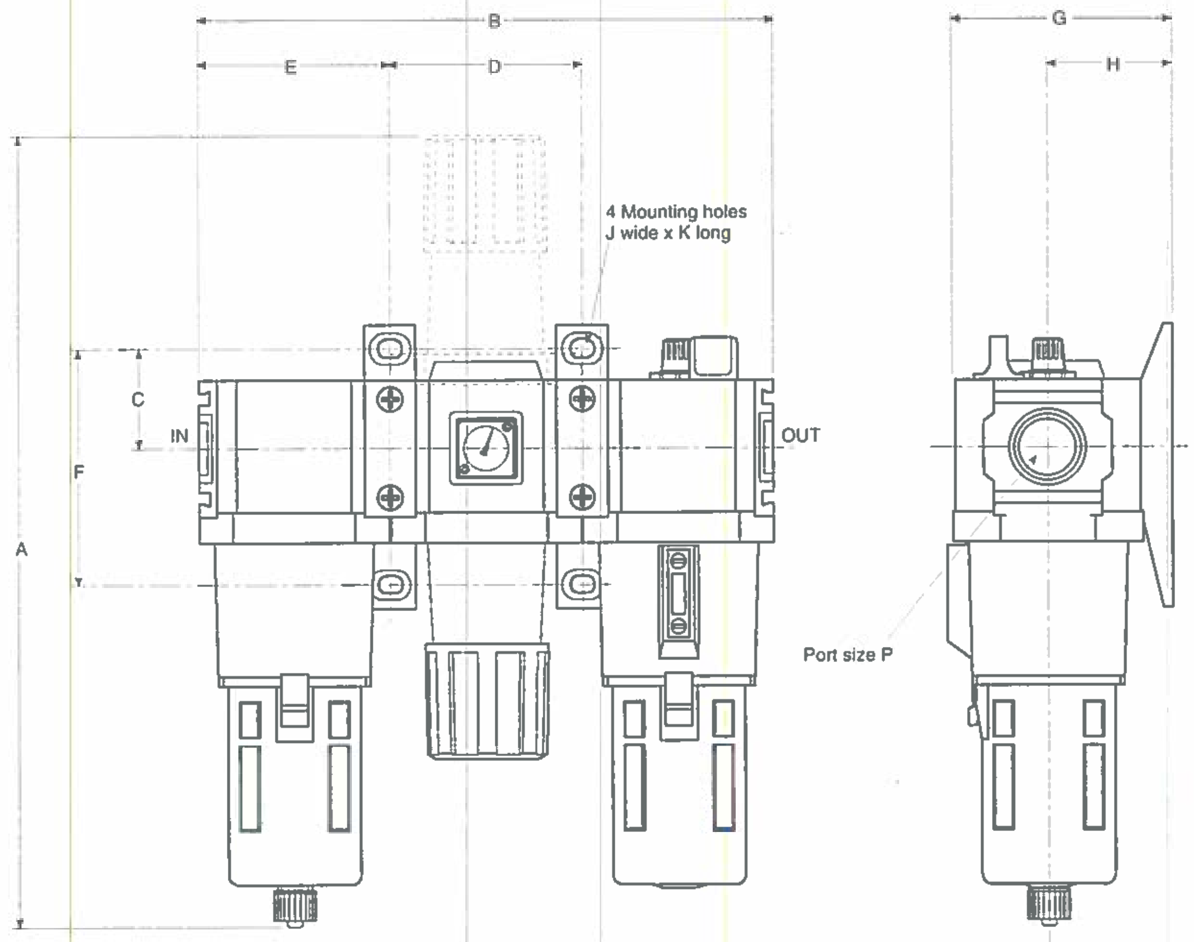
C8000-20G



C8000-25G



6. Installation dimensions in mm



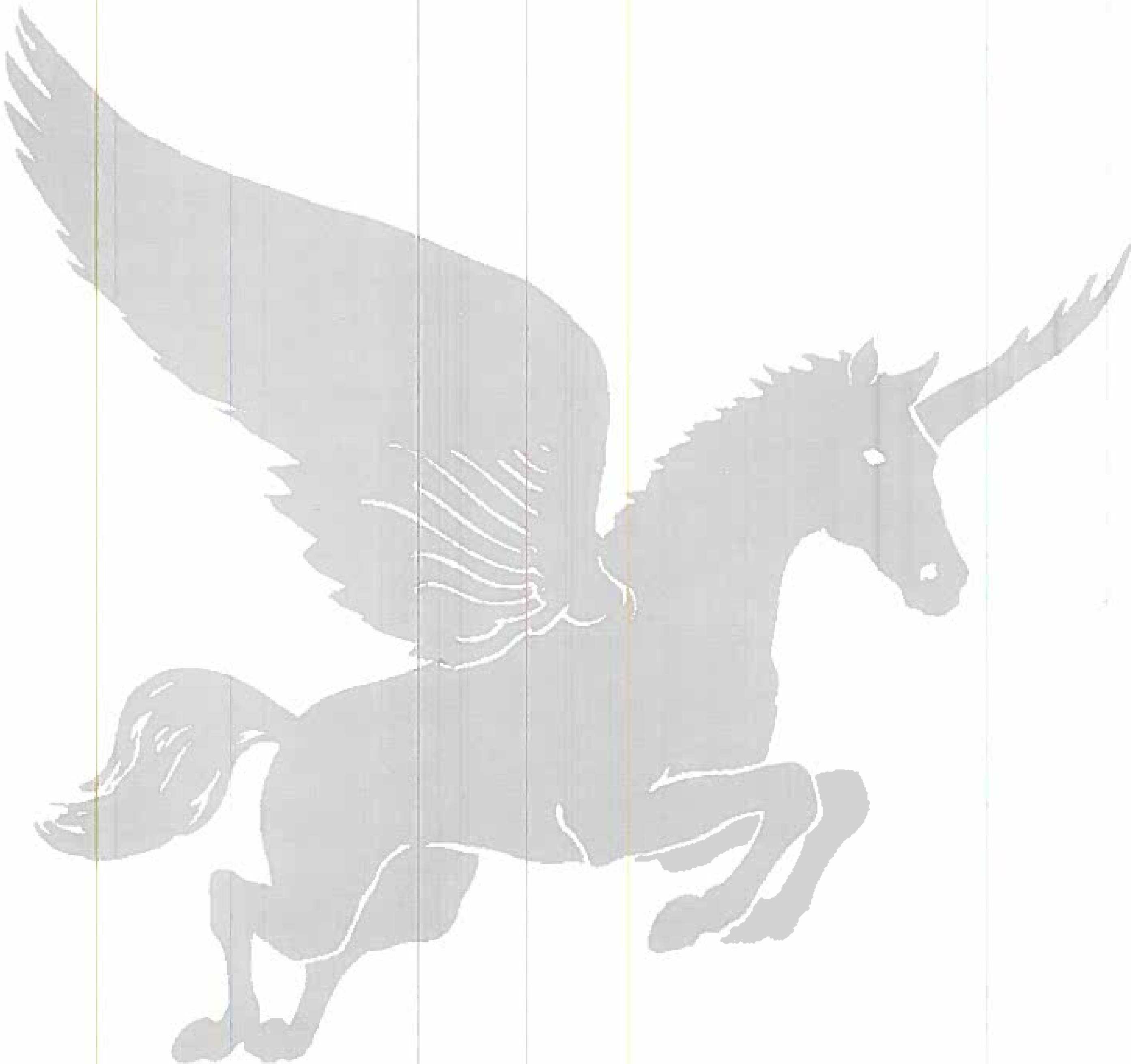
Model code	A*	B	C	D	E	F	G	H	J	K	P
C8000-20G	407	300	50	100	100	120	115	65	9	14	G3/4"
C8000-25G	407	300	50	100	100	120	115	65	9	14	G1"

* *With regulator in inverted position (solid lines) maximum overall height A = 302mm*

		Preferred model selection				Page numbers
		Port size	Model code	Description	Maximum flow	
Electronic regulator		G1/4" G1/2"	LER1-C2-BA00 LER1-C4-BA00	Bar, 4-20mA Bar, 4-20mA	77.8 dm³/sec 94.3 dm³/sec	ER 2.1 ER 2.2
Electronic regulator		G3/4"	LER2-C6-BA00	Bar, 4-20mA	94.3 dm³/sec	ER 3.1 ER 3.2

Instrumentation products

Pneumatics



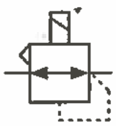
Electronic regulators - LER1
1/4", 3/8", 1/2" BSP

1. General description and application benefits

High flow double diaphragm type electro-pneumatic regulators capable of delivering very accurate closed-loop control of pressures over a wide range of flows.
The integral system of two control valves and pressure transducer provide high accuracy and repeatability through instantaneous pressure adjustment.
Controlled by external signal or by internal adjustment for stand alone operation.

- Single unit for alternative control signals.
- High flow (5600 lt/min).
- Two pressure ranges - one unit.
- On-board digital LCD display of ***true*** outlet pressure in bar or psig.
- Unit factory configured or can be customer configured.
- Internal 5 micron filtration of air to controller.
- Integrates with 18 series Pegasus particle filters.

2. Functional symbol



4. Model code

L E R 1 - C * - * * * 0

[1] [2] [3] [4]

[1] Thread size	[2] LCD Display	[3] Control signal	[4] Range
2 = 1/4"	0 = None	0 = 0 - 10v DC	0 = 0-8.6bar (0-125psig)
3 = 3/8"	B = Bar	A = 4 - 20 mA	H = 0-6.0bar (0-90psig)
4 = 1/2"	P = PSI	B = Internal resistor	D = 0-4.0bar (0-60psig)
			C = 0-2.0bar (0-30psig)

Preferred model selection

LER1-C2-BA00	Modular electronic regulator 4 - 20mA with LCD (bar), 1/4"BSP
LER1-C4-BA00	Modular electronic regulator 4 - 20mA with LCD (bar), 1/2"BSP

Unit supplied as standard for control signal 4 - 20mA, Bar digital readout and 0-8.6bar (0-125psig) range.
Unit can be configured to give alternative control signal, readout and range as required (see Section 7, page ER 2.2).

5. Operating data

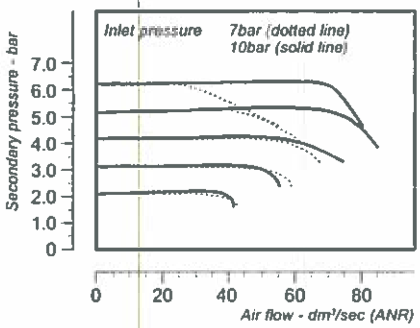
Supply pressure	1.4 - 10bar (20 - 150psig)	
Output pressure	0.7 - 8.6bar (10 - 125psig)	
Operating temperature	5° - 52°C (40° - 125°F)	
Maximum flow *(at 10 bar inlet pressure and 6 bar secondary pressure)*	LER1-C2-BA00 LER1-C3-BA00 LER1-C4-BA00	77.8 dm³/sec (165scfm) 94.3 dm³/sec (200scfm) 94.3 dm³/sec (200scfm)
Flow characteristics	See overleaf	
Supply voltage	up to 28v DC	
Supply current	250mA maximum	
Control signal	Voltage 0 - 10v DC Current 4 - 20mA Internal Resistor	
Monitor output	0 - 10v DC [1v DC per 0.9bar(12.5 psig)]	
Sensitivity	+/- 0.8% of FS	
Hysteresis / repeatability	+/- 0.8% of FS	
Linearity	< 0.07 bar (1.0 psig)	
Response	with step input 600ms	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Materials of construction	Body - Aluminium alloy. Body cap - Aluminium alloy. Diaphragms - Nitrile/Zinc/Brass. Valve assembly - Brass/Nitrile. Springs - Stainless steel. Bottom plug - Glass filled Nylon.	Body cover - ABS. Diaphragm plate - Acetal. Seals - Nitrile. Panel nut - Acetal.
Operating medium	Compressed air, filtered and non lubricated. ***If installed in lubricated system use ISO VG32 mineral oil and unit must be installed in vertical position with operating head uppermost***	
Installation dimensions	See overleaf	
Mountings	See page MA 2 .1	
Accessories	See page MA 2.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4" BSP - See page MA 2.1	
Mass	0.80kg (1.76lb)	
Service kits	Consult Customer Services Department	

3. Typical applications

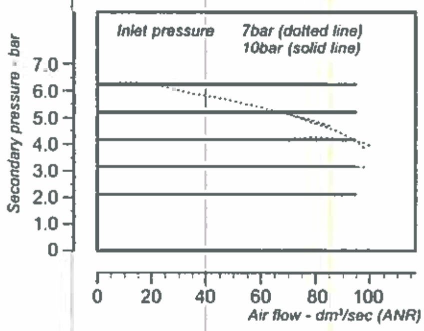
- Welding tip pressure control.
- Roll tension.
- Tank pressure control.
- Spray painting process.
- Cylinder force control.
- Aircraft simulators.
- Filter cloth pressure control.
- Air motor speed control.

6. Flow characteristics

LER1-C2-BA00



LER1-C4-BA00



7. Configuration and wiring connections

The same control board is used for all control signal options to provide maximum flexibility at minimum cost. The board must be configured for each particular application by positioning the jumpers correctly and wiring correctly. ***This is a very important step to ensure optimum performance.***

Determine the signal that will be used to control the regulator and follow the configuration and wiring instructions for that application.
Caution: Improper wiring may result in damage to the unit.

To configure the unit for the desired option, and to connect the external wires to the unit remove the LCD housing by removing the two screws on top of the unit. Carefully lift the housing off and lay it to one side, making sure not to damage the ribbon cable that connects the control board to the LCD board.

Once the signals being used have been determined it is necessary to jumper the appropriate terminal pins located in the upper left hand side of the board (see figure 1). The terminal pins are numbered 1 to 7, right to left. There are *four* jumpers that must be installed for the various options as follows:

OPTION 1 - Sensor feedback signal
a. Internal sensor — Jumper on position 5
or b. External sensor — Jumper on position 6
Note: Only one sensor signal can be used at a time.

OPTION 2 - LCD display mode
a. psig — Jumper on position 4
or b. bar — Jumper off position 4
Note: If using bar option, be careful not to lose jumper.

OPTION 3 - Control signal
a. 0 - 10v DC — Jumper on position 1
or b. Internal control — Jumper on position 2
or c. 4 - 20mA — Jumper on position 3
Note: Only one control signal at a time can be used.

OPTION 4 - Pressure range
Each control board has two pressure ranges available and can be selected by the Jumper on position 7.

The high range board can be configured for either:-
a. 0-90psig (0-6bar) — Jumper on position 7
or b. 0-125psig (0-8.6bar) — Jumper off position 7
Note: If using high setting, be careful not to lose jumper.

The low range board can be configured for either:-
a. 0-30psig (0-2bar) — Jumper on position 7
or b. 0-60psig (0-4bar) — Jumper off position 7
Note: If using high setting, be careful not to lose jumper.

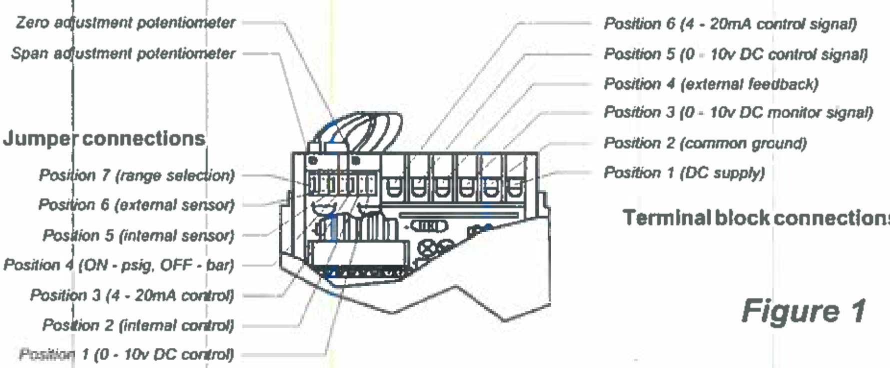


Figure 1

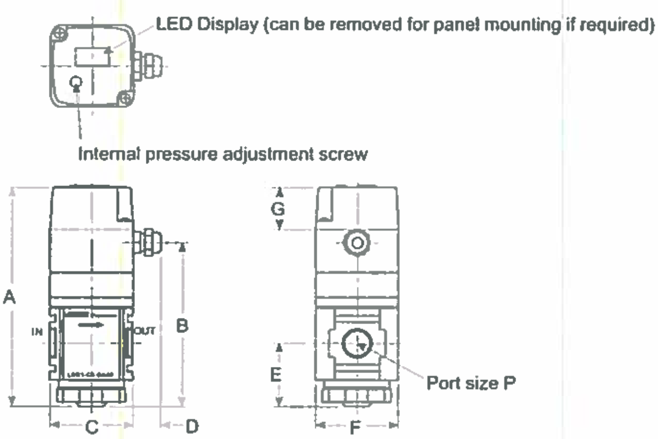
Now, with the unit configured to the desired options the external electrical connections can be made to the control board terminal block located on the upper right hand side of the unit (See figure 1).
Connections will be dependent on whether the exernal control circuit or the internal resistor control has been configured.

Further details on cable to be used and connections to be made can be found in the installation and maintenance instructions supplied with the unit (additional copies available on request if required).

Note: ***If the control board pressure range has been changed (Option 4) it is essential that the LCD display is re-configured:-***

Zero and span adjustment
Energize the unit. Input a control signal of 0 vDC and using a volt meter measure the output at position 3 of the terminal block. The output should be -0.01 to 0 vDC. If not turn the zero potentiometer until output is correct.
To adjust span attach an external pressure gauge and apply a control signal of 8 vDC. Adjust the span potentiometer until the P2 pressure is 80% of the range selected.
i.e. 24psig (1.6bar) for 0-30psig (0-2bar) range, 48psig (3.3bar) for 0-60psig (0-4bar) range, 72psig (4.9bar) for 0-90psig (0-6bar) range, 100psig (6.8bar) for 0-125psig (0-8.6bar) range.

8. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	P
LER1-C2-BA00	160	120	60	20	45	60	30	G1/4"
LER1-C4-BA00	160	120	60	20	45	60	30	G1/2"

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel:- (01952) 586000 Fax:- (01952) 586798

Printed in Great Britain

GB-P5018-ER1-0297

VICKERS

Pneumatics

Pegasus

Electronic regulators - LER2
3/8", 1/2", 3/4" BSP

4. Model code

L E R 2 - C * - * * * 0

[1] [2] [3] [4]

[1] Thread size	[2] LCD Display	[3] Control signal	[4] Range
3 = 3/8"	0 = None	0 = 0 - 10v DC	0 = 0-8.6bar (0-125psig)
4 = 1/2"	B = Bar	A = 4 - 20 mA	H = 0-6.0bar (0-90psig)
6 = 3/4"	P = PSI	B = Internal resistor	D = 0-4.0bar (0-60psig)
			C = 0-2.0bar (0-30psig)

Preferred model selection

LER2-C6-BA00	Modular electronic regulator 4 - 20mA with LCD (bar), 3/4"BSP

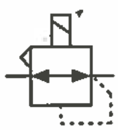
Unit supplied as standard for control signal 4 - 20mA, Bar digital readout and 0-8.6bar (0-125psig) range.
Unit can be configured to give alternative control signal, readout and range as required (see Section 7, page ER 3.2).

1. General description and application benefits

High flow double diaphragm type electro-pneumatic regulators capable of delivering very accurate closed-loop control of pressures over a wide range of flows.
The integral system of two control valves and pressure transducer provide high accuracy and repeatability through instantaneous pressure adjustment.
Controlled by external signal or by internal adjustment for stand alone operation.

- Single unit for alternative control signals.
- High flow (5600 lt/min).
- Two pressure ranges - one unit.
- On-board digital LCD display of ***true*** outlet pressure in bar or psig.
- Unit factory configured or can be customer configured.
- Internal 5 micron filtration of air to controller.
- Integrates with 28 series Pegasus particle filters.

2. Functional symbol



3. Typical applications

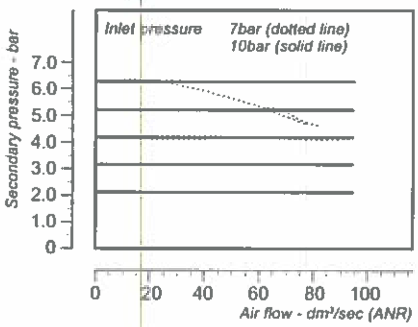
- Welding tip pressure control.
- Roll tension.
- Tank pressure control.
- Spray painting process.
- Cylinder force control.
- Aircraft simulators.
- Filter cloth pressure control.
- Air motor speed control.

5. Operating data

Supply pressure	1.4 - 10bar (20 - 150psig)		
Output pressure	0.7 - 8.6bar (10 - 125psig)		
Operating temperature	5° - 52°C (40° - 125°F)		
Maximum flow *(at 10 bar inlet pressure and 6 bar secondary pressure)*	LER2-C3-BA00 LER2-C4-BA00 LER2-C6-BA00	94.3 dm³/sec (200scfm) 94.3 dm³/sec (200scfm) 94.3 dm³/sec (200scfm)	
Flow characteristics	See overleaf		
Supply voltage	up to 28v DC		
Supply current	250mA maximum		
Control signal	Voltage Current Internal	0 - 10v DC 4 - 20mA Resistor	
Monitor output	0 - 10v DC [1v DC per 0.9bar(12.5 psig)]		
Sensitivity	+/- 0.8% of FS		
Hysteresis / repeatability	+/- 0.8% of FS		
Linearity	< 0.07 bar (1.0 psig)		
Response	with step input 600ms		
Type of connection	Screwthread		
Thread size	3/8", 1/2", 3/4"BSP		
Materials of construction	Body - Aluminium alloy. Body cap - Aluminium alloy. Diaphragms - Nitrile/Zinc/Brass. Valve assembly - Brass/Nitrile. Springs - Stainless steel. Bottom plug - Glass filled Nylon.		Body cover - ABS. Diaphragm plate - Acetal. Seals - Nitrile. Panel nut - Acetal.
Operating medium	Compressed air, filtered and non lubricated. ***If installed in lubricated system use ISO VG32 mineral oil and unit must be installed in vertical position with operating head uppermost***		
Installation dimensions	See overleaf		
Mountings	See page MA 3.1		
Accessories	See page MA 3.1		
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4" BSP - See page MA 3.1		
Mass	1.10kg (2.43lb)		
Service kits	Consult Customer Services Department		

6. Flow characteristics

LER2-C6-BA00



7. Configuration and wiring connections

The same control board is used for all control signal options to provide maximum flexibility at minimum cost. The board must be configured for each particular application by positioning the jumpers correctly and wiring correctly. ***This is a very important step to ensure optimum performance.***

Determine the signal that will be used to control the regulator and follow the configuration and wiring instructions for that application. ***Caution: Improper wiring may result in damage to the unit.***

To configure the unit for the desired option, and to connect the external wires to the unit remove the LCD housing by removing the two screws on top of the unit. Carefully lift the housing off and lay it to one side, making sure not to damage the ribbon cable that connects the control board to the LCD board.

Once the signals being used have been determined it is necessary to jumper the appropriate terminal pins located in the upper left hand side of the board (see figure 1). The terminal pins are numbered 1 to 7, right to left. There are ***four*** jumpers that must be installed for the various options as follows:

OPTION 1 - Sensor feedback signal

a. Internal sensor — Jumper on position 5
or b. External sensor — Jumper on position 6

Note: Only one sensor signal can be used at a time.

OPTION 2 - LCD display mode

a. psig — Jumper on position 4
or b. bar — Jumper off position 4

Note: If using bar option, be careful not to lose jumper.

OPTION 3 - Control signal

a. 0 - 10v DC — Jumper on position 1
or b. Internal control — Jumper on position 2
or c. 4 - 20mA — Jumper on position 3

Note: Only one control signal at a time can be used.

OPTION 4 - Pressure range

Each control board has two pressure ranges available and can be selected by the Jumper on position 7

The high range board can be configured for either:-

a. 0-90psig (0-6bar) — Jumper on position 7
or b. 0-125psig (0-8.6bar) — Jumper off position 7

Note: If using high setting, be careful not to lose jumper.

The low range board can be configured for either:-

a. 0-30psig (0-2bar) — Jumper on position 7
or b. 0-60psig (0-4bar) — Jumper off position 7

Note: If using high setting, be careful not to lose jumper.

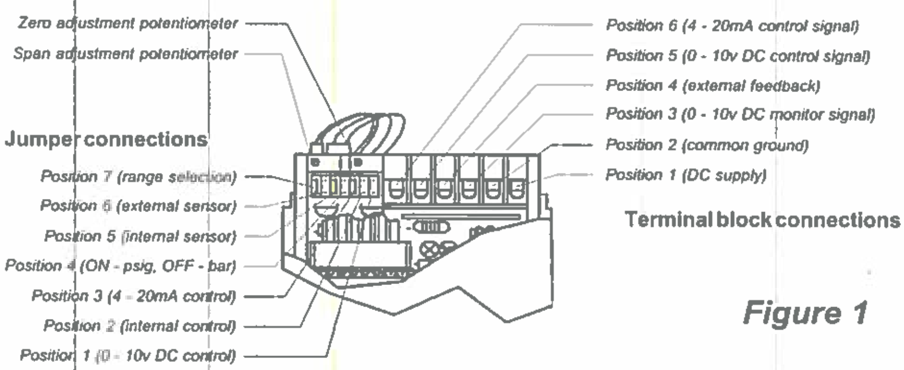


Figure 1

Now, with the unit configured to the desired options the external electrical connections can be made to the control board terminal block located on the upper right hand side of the unit (See figure 1).
Connections will be dependent on whether the external control circuit or the internal resistor control has been configured.

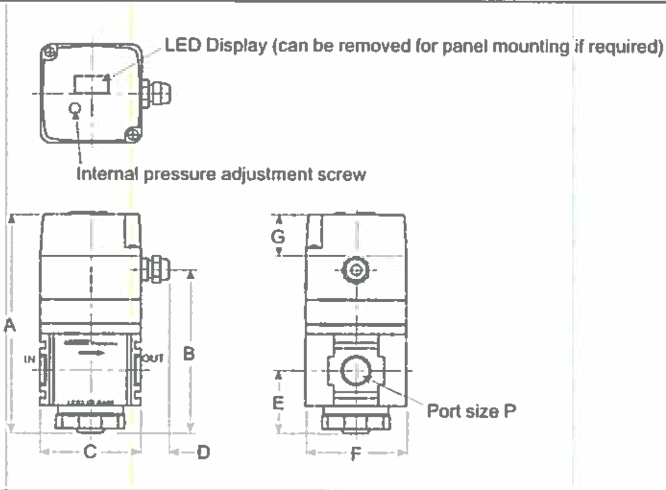
Further details on cable to be used and connections to be made can be found in the installation and maintenance instructions supplied with the unit (additional copies available on request if required).

Note: ***If the control board pressure range has been changed (Option 4) it is essential that the LCD display is re-configured:-***

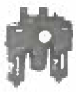
Zero and span adjustment
Energize the unit. Input a control signal of 0 vDC and using a volt meter measure the output at position 3 of the terminal block. The output should be -0.01 to 0 vDC. If not turn the zero potentiometer until output is correct.
To adjust span attach an external pressure gauge and apply a control signal of 8 vDC. Adjust the span potentiometer until the P2 pressure is 80% of the range selected.

i.e. 24psig (1.6bar) for 0-30psig (0-2bar) range,
48psig (3.3bar) for 0-60psig (0-4bar) range,
72psig (4.9bar) for 0-90psig (0-6bar) range,
100psig (6.8bar) for 0-125psig (0-8.6bar) range.

8. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	P
LER2-C6-BA00	160	120	73	20	45	73	30	G3/4"

		Preferred model selection				Page numbers
		Port size	Model code	Description	Maximum flow	
Safety shut off/ exhaust valve		G1/8"	LV08-C1-0000	Manual	26.2 dm³/sec	E 1.1
		G1/4"	LV08-C2-0000	Manual	47.2 dm³/sec	
Mounting accessories			GPA-96-738	Joiner set		MA 1.1
			GPA-96-737	T Bracket		
			GRP-95-147	L Bracket		
Gauges			GRP-96-722	0 - 11 bar		MA 1.1
			GRP-96-723	0 - 4 bar		
Particle filters		G1/8"	LF08-C1-SK00	Manual drain	11.8 dm³/sec	F 1.1
		G1/8"	LF08-C1-SR00	Auto drain	11.8 dm³/sec	F 1.2
		G1/4"	LF08-C2-SK00	Manual drain	23.6 dm³/sec	
		G1/4"	LF08-C2-SR00	Auto drain	23.6 dm³/sec	
Coalescing filters		G1/4"	LM08-C2-BK00	Manual drain	7.3 dm³/sec	M 1.1
		G1/4"	LM08-C2-BR00	Auto drain	7.3 dm³/sec	M 1.2
Regulators		G1/8"	LR08-C1-F0G0	With gauge	13.5 dm³/sec	R 1.1
		G1/8"	LR08-C1-F000	Without gauge	13.5 dm³/sec	R 1.2
		G1/4"	LR08-C2-F0G0	With gauge	18.9 dm³/sec	
		G1/4"	LR08-C2-F000	Without gauge	18.9 dm³/sec	
Filter Regulators		G1/8"	LB08-C1-FKG0	Man dr + gauge	13.5 dm³/sec	B 1.1
		G1/8"	LB08-C1-FRG0	Auto dr + gauge	13.5 dm³/sec	B 1.2
		G1/8"	LB08-C1-FK00	Manual drain	13.5 dm³/sec	
		G1/8"	LB08-C1-FR00	Auto drain	13.5 dm³/sec	
		G1/4"	LB08-C2-FKG0	Man dr + gauge	19.9 dm³/sec	
		G1/4"	LB08-C2-FRG0	Auto dr + gauge	19.9 dm³/sec	
		G1/4"	LB08-C2-FK00	Manual drain	19.9 dm³/sec	
		G1/4"	LB08-C2-FR00	Auto drain	19.9 dm³/sec	
Lubricators		G1/8"	LL08-C1-LK00	Manual drain	11.0 dm³/sec	L 1.1
		G1/4"	LL08-C2-LK00	Manual drain	27.1 dm³/sec	L 1.2
Filter/Regulator, Lubricator combinations		G1/8"	LD08-C1-FKG0	Manual drain	13.5 dm³/sec	D 1.1
		G1/8"	LD08-C1-FRG0	Auto drain	13.5 dm³/sec	D 1.2
		G1/4"	LD08-C2-FKG0	Manual drain	18.0 dm³/sec	
		G1/4"	LD08-C2-FRG0	Auto drain	18.0 dm³/sec	
Filter, Regulator, Lubricator combinations		G1/8"	LC08-C1-FKG0	Manual drain	13.5 dm³/sec	C 1.1
		G1/8"	LC08-C1-FRG0	Auto drain	13.5 dm³/sec	C 1.2
		G1/4"	LC08-C2-FKG0	Manual drain	18.9 dm³/sec	
		G1/4"	LC08-C2-FRG0	Auto drain	18.9 dm³/sec	
Options		Metal bowls with sight glass Non relieving regulators Low pressure springs Tamper resistant kit for lubricators				See relevant product pages
		Modular end blocks - 1/8", 1/4", 3/8" BSP				MA 1.1

Extract from:- EN 983:1994 *(Final draft)* - Safety requirements for fluid power systems and their components - Pneumatics.

"Scope

This standard applies to pneumatic systems and their components on machinery. It identifies hazards and factors which affect the safety of systems and their components when they are put to their intended use.

Gas bottles and receivers are excluded from the scope of this standard. For receivers see EN286-1.

The principles specified apply to the design, construction and modification of new systems and their components and aspects of use including:

- assembly, installation, adjustment, operation, cleaning and maintenance.

Components are covered in the standard, but only to the extent that safety requirements are given to allow the components to be safely integrated into the system design.

The standard applies to systems and their components on machinery that are manufactured after the date of the adoption of this standard."

AIR TREATMENT and CONTROL

Safety shut off / exhaust valve - LV08
1/8", 1/4" BSP

1. General description and application benefits

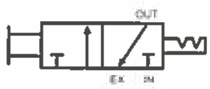
Manually operated slide type 3 way valve of modular design for installation immediately upstream of any filter, filter/regulator or FRL units. Valve is secured to unit by means of joiner set.

In the closed position downstream air is exhausted to atmosphere. Particularly useful for isolating and depressurizing downstream units requiring maintenance or replacement.

Push / push operation gives positive open and closed positions. The valve slide can be locked in the closed position with a user supplied padlock.

- Slide valve construction.
- Downstream air exhausted in closed position. **
- High flow, high efficiency.
- Push / push action.
- Readily identifiable by bright orange colour of slide mechanism.
- Display provides visual check.
- Pad lockable in closed position. **

2. Functional symbol



** **Conforms to EN 983 : 1994 *(Final draft)***
Safety requirements for fluid power systems and their components - Pneumatic.

3. Preferred model selection

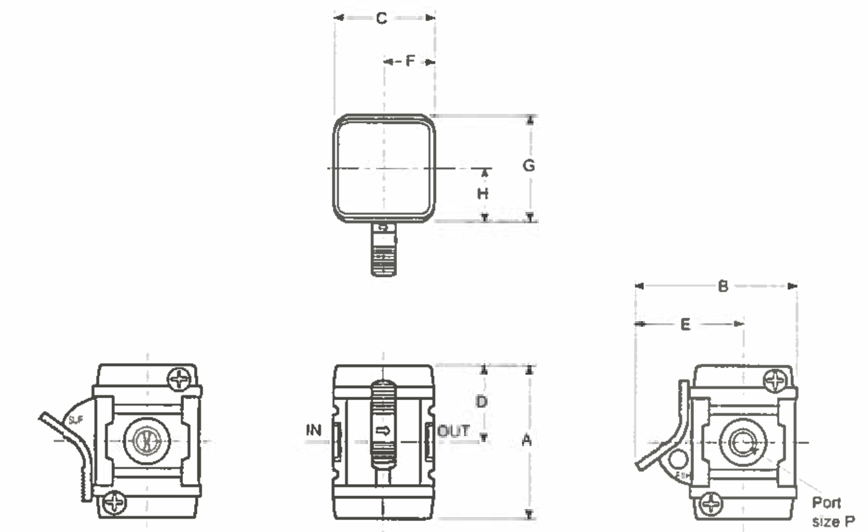
LV08-C1-0000	Modular safety shut off valve, manually operated, 1/8"BSP
LV08-C2-0000	Modular safety shut off valve, manually operated, 1/4"BSP

4. Operating data

Maximum operating pressure	10bar (150psig)	
Maximum operating temperature	79°C (175°F)	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LV08-C1-0000 LV08-C2-0000	26.2 dm³/sec (55.5 scfm) 47.2 dm³/sec (100 scfm)
Exhaust flow *	LV08-C1-0000 LV08-C2-0000	Kv = 3.44 (Cv = 0.241) Kv = 3.62 (Cv = 0.253)
Type of connection	Screwthread	
Thread size	1/8", 1/4"BSP	
Materials of construction	Body - Zinc Blade - Acetal Seals - Nitrile	
Installation dimensions	See below	
Mountings	See page MA 1.1	
Accessories	See page MA 1.1	
Port adaptors (when required)	1/8", 1/4", 3/8"BSP - See page MA 1.1	
Mass	0.30kg (0.66lb)	
Service kits	Replace unit	

Note: * *Kv (Cv) for inlet pressure of 10 bar (145 psig).*

5. Installation dimensions in mm

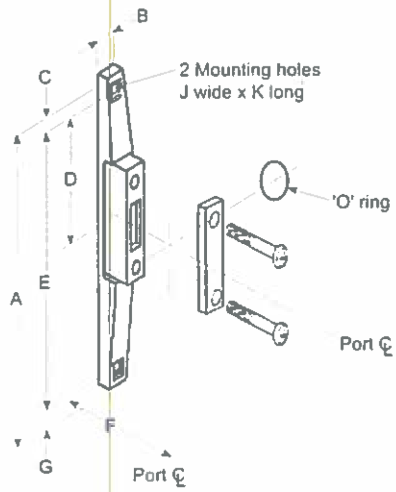


Inlet end view shown in open position

Model code	A	B	C	D	E	F	G	H	P
LV08-C1-0000	61.2	62.5	40	30.7	41.4	20	42.7	21.3	G1/8"
LV08-C2-0000	61.2	62.5	40	30.7	41.4	20	42.7	21.3	G1/4"

Mountings and accessories

T Bracket

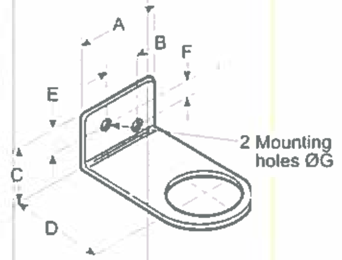


Part number	A	B	C	D	E
GPA-96-737	100	16	10	35	80

F	G	J	K
40	10	5.6	7.5

L Bracket

For LR08 series regulators and LB08 series filter / regulators

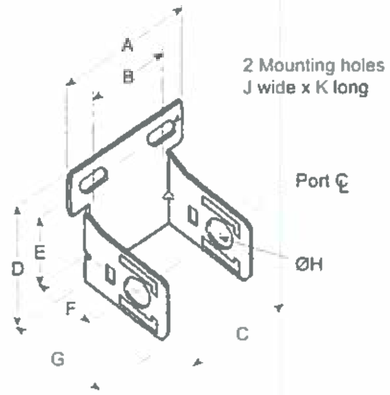


Part number	A	B	C	D
GRP-95-147	38	17	25	44

E	F	G
8.6	7.9	5.6

C Bracket

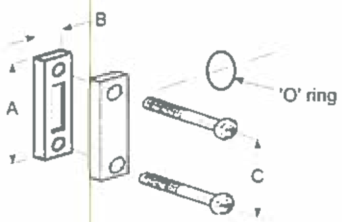
For LF08 series filters, LM08 series coalescing filters and LL08 series lubricators



Part number	A	B	C	D	E
GPA-97-010	68	44	40	61	35

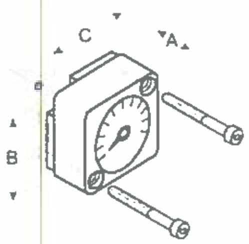
F	G	H	J	K
40	59	14	8.5	10

Joiner set



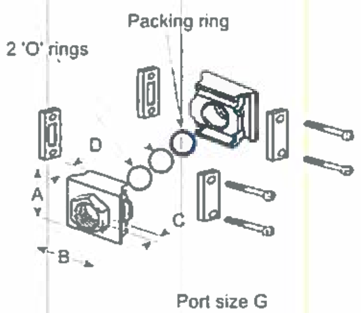
Part number	A	B	C
GPA-96-738	36	10	26

Gauge



Part number	Range	A	B	C
GRP-96-722	0 - 11 bar	15	27	27
GRP-96-723	0 - 4 bar	15	27	27

Piping adaptor set

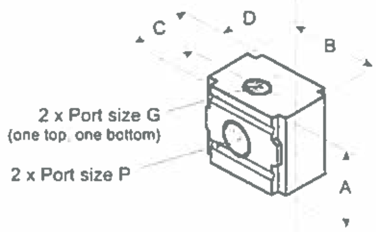


Part number	A	B	C	D	G
GPA-97-066	36	40	13.5	8	G1/8"
GPA-97-067	36	40	13.5	8	G1/4"
GPA-97-065	36	40	13.5	8	G3/8"

Piping adaptor set also available with T bracket:-

Part number	A	B	C	D	G
GPA-97-025	36	40	13.5	8	G1/8"
GPA-97-026	36	40	13.5	8	G1/4"
GPA-97-027	36	40	13.5	8	G3/8"

Distributor block



Standard distributor block:-

Part number	A	B	C	D	G	P
LN08-C2-0000	48	60	48	30	G1/4"	G1/4"

Distributor block with check valve:-

Part number	A	B	C	D	G	P
LN08-C2-C000	48	60	48	30	G1/4"	G1/4"

Operating data

Maximum operating pressure		21bar (300 psig)
Maximum operating temperature		79°C (175°F)
Maximum flow*	LN08-C2-0000	62.7dm³/sec (133scfm)
	LN08-C2-C000	24.7dm³/sec (52.3scfm)
Type of connection		Screwthread
Materials of construction		Body - Aluminium Check valve - Nitrile
Mass	LN08-C2-0000	0.15kg (0.33lb)
	LN08-C2-C000	0.15kg (0.33lb)

* *Value based at inlet pressure of 10 bar and pressure drop of 0.3bar*

Particle filters - LF08
1/8", 1/4" BSP

1. General description and application benefits

High performance filters designed to remove solid and liquid contaminants from compressed air lines.

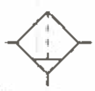
The LF08 filter utilizes a 5 micron sintered polypropylene element giving superior filtration results.

Metal bowl options, with sight glass, are available.

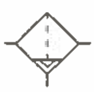
All filters are available with manual drain as standard or optionally with automatic piston drain.

- Lightweight modern design.
- High flow, high efficiency.
- Integral quick disconnect clear nylon bowl with guard.**
- Corrosion resistant nylon bowl guard with all round view slots.
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbols



Manual drain



Automatic drain

**** Conforms to EN 983 : 1994 *(Final draft)***
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L F 0 8 - C $\underset{\boxed{1}}{*}$ - $\underset{\boxed{2}}{S}$ $\underset{\boxed{3}}{*}$ 0 0

[1] **Thread size**
1 = 1/8"
2 = 1/4"

[2] **Element**
S = 5 micron

[3] **Bowl / Drain**
K = Nylon with guard / Manual drain
L = Metal with sight glass / Manual drain
R = Nylon with guard / Automatic piston drain
S = Metal with sight glass / Automatic piston drain

Preferred model selection

LF08-C1-SK00	Modular particle filter with nylon bowl and manual drain, 1/8"BSP
LF08-C1-SR00	Modular particle filter with nylon bowl and automatic drain, 1/8"BSP
LF08-C2-SK00	Modular particle filter with nylon bowl and manual drain, 1/4"BSP
LF08-C2-SR00	Modular particle filter with nylon bowl and automatic drain, 1/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/8"BSP, particle filter with metal bowl and automatic drain. Order as LF08-C1-SS00

4. Operating data

Maximum operating pressure	Nylon bowl Metal bowl	10bar (150psig) 17bar (250psig)
Maximum operating temperature	Nylon bowl Metal bowl	52°C (125°F) 79°C (175°F)
Standard filtration	5 micron	
Retention capacity	12 cm^3	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LF08-C1-SK00 LF08-C2-SK00	11.8 dm^3/sec (25.0 scfm) 23.6 dm^3/sec (50.0 scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/8", 1/4"BSP	
Materials of construction	Body - Zinc Body cover - ABS Bowl -Polyamid or Zinc Bowl guard - Polyamid Element - Sintered polypropylene Seals - Nitrile (Nylon bowl) Fluorocarbon (Metal bowl)	
Installation dimensions	See overleaf	
Mountings	See page MA 1.1	
Accessories	See page MA 1.1	
Port adaptors (when required)	1/8", 1/4",3/8" BSP - See page MA 1.1	
Mass	0.20kg (0.44lb)	
Service kits† - Replacement element - Bowl assembly - Bowl 'O' ring	FRP-96-729 GRP-96-712 (Manual drain) GRP-96-710	

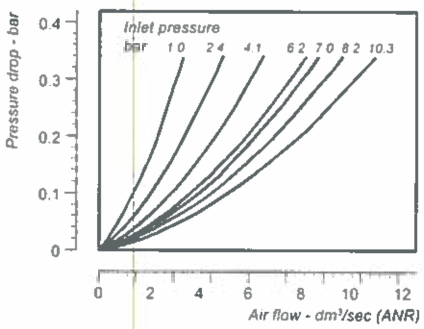
Notes: † Part numbers given are for standard units with nylon bowls
- For service kits relating to other variants contact Customer Services Department.

VICKERS

Pneumatics

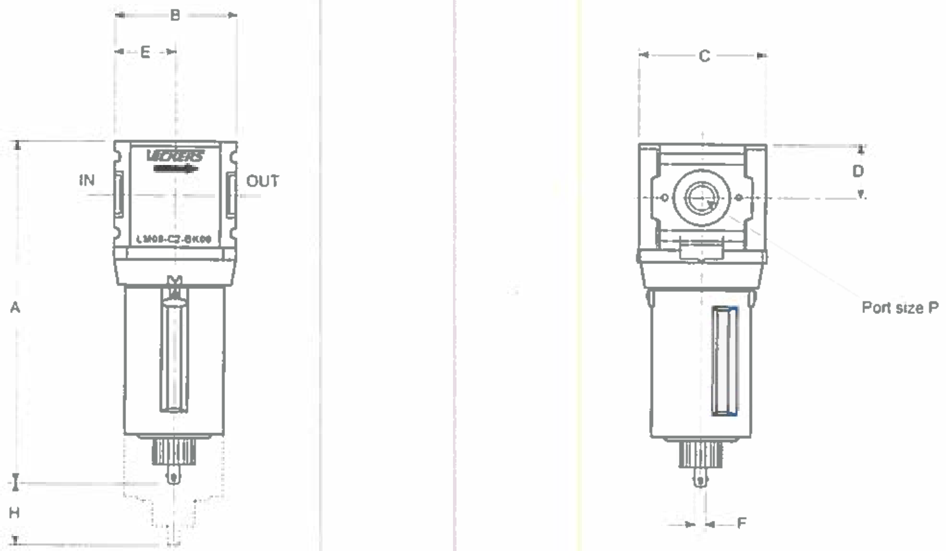
5. Flow characteristics

LM08-C2-BK00



Characteristics and requirements for compressed air filters are in accordance with ISO 5782-1, *Pneumatic fluid power - Compressed air filters - Part 1.*

6. Installation dimensions in mm



Model code	A	B	C	D	E	F	H	P
LM08-C2-BK00	116.3	40	42.7	18.3	20	4mm I.D. tube barb fitting	33.3	G1/4"

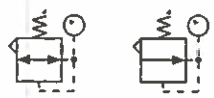
Regulators - LR08
1/8", 1/4" BSP

1. General description and application benefits

Spring loaded diaphragm type regulators featuring a balanced valve for superior regulation characteristics.
The LR08 regulators, if ordered without gauges, are provided with 2 off G1/8" gauge ports which can be used for fitting centre back mounted gauges or as additional regulator outlets if no pressure gauge is required.
The standard LR08 model is self relieving with non relieving available as an option.

- Lightweight.
- High flow, high efficiency.
- Self relieving **
  (Non relieving option available)
- Available with or without pressure gauge.
- Integral body thread or port adaptors.
- Full range of accessories.
- Non rising adjustment.
- ***Unique flush mounted pressure gauge.***

2. Functional symbols



Self relieving   Non relieving

**** Conforms to EN 983 : 1994 *(Final draft)***
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L R 0 8 - C * - * 0 * 0

[1] [2] [3]

[1] Thread size
1 = 1/8"
2 = 1/4"

[2] Diaphragm / Spring range
C = Self relieving / 0 - 2.1bar
D = Self relieving / 0 - 4.1bar
F = Self relieving / 0 - 8.5bar
P = Non relieving / 0 - 2.1bar
Q = Non relieving / 0 - 4.1bar
R = Non relieving / 0 - 8.5bar
(Code 'F' is standard)

[3] Options
0 = None
G = Pressure gauge

Note: 1) Unit without gauge has 2 off 1/8"BSP gauge ports.
2) Unit with gauge has 2 gauge mounting positions - one fitted with blanking plate.

Preferred model selection

LR08-C1-F0G0	Modular regulator with gauge and 0 - 8.5bar (0-125psig) spring, 1/8"BSP
LR08-C1-F000	Modular regulator, without gauge, with 0 - 8.5bar (0-125psig) spring, 1/8"BSP
LR08-C2-F0G0	Modular regulator with gauge and 0 - 8.5bar (0-125psig) spring, 1/4"BSP
LR08-C2-F000	Modular regulator without gauge, with 0 - 8.5bar (0-125psig) spring, 1/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/4"BSP, self relieving regulator with 0 - 4.1bar (0 - 60psig) range spring and fitted with gauge. Order as LR08-C2-D0G0

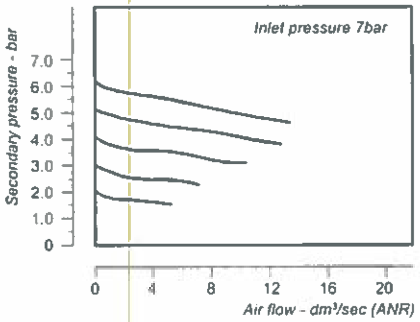
NOTE: For unit without pressure gauge order gauge separately - see page PG 1.1

4. Operating data

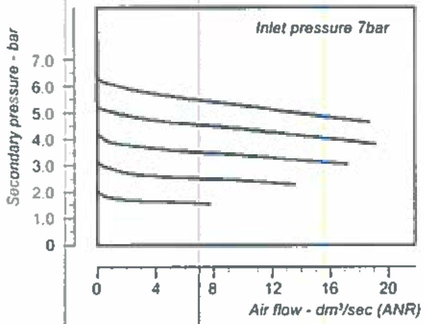
Maximum supply pressure	21bar (300 psig)
Adjustment range pressure	0 - 2.1bar (0 - 30 psig) 0 - 4.1bar (0 - 60 psig) 0 - 8.5bar (0 - 125 psig)
Maximum operating temperature	79° C (175° F)
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LR08-C1-F000 13.5 dm³/sec (28.6 scfm) LR08-C2-F000 18.9 dm³/sec (40.0 scfm)
Flow characteristics	See overleaf
Type of connection	Screwthread
Thread size	1/8", 1/4"BSP
Gauge ports (regulator without gauge)	2 x 1/8"BSP
Materials of construction	Body - Zinc Body cap - ABS Knob and panel nut - Acetal Bonnet - PBT Valve assembly - Brass/nitrile Diaphragm assembly - Brass/nitrile Springs - Steel Seals - Nitrile
Installation dimensions	See overleaf
Mountings	See page MA 1.1
Accessories	Tamper resistant kit RPA-96-735 and See page MA 1.1
Port adaptors (when required)	1/8", 1/4", 3/8"BSP - See page MA 1.1
Mass	0.30kg (0.66lb)
Service kits - Diaphragm assembly	GRP-96-725 (Self relieving) GRP-96-726 (Non relieving)
- Valve assembly kit	RRP-96-727
- Pressure springs (0 - 2.1bar)	GRP-95-111
(0 - 4.1bar)	GRP-96-718
(0 - 8.5bar)	GRP-96-717
- Plastic panel nut	RPA-96-734

5. Flow characteristics

LR08-C1-F000

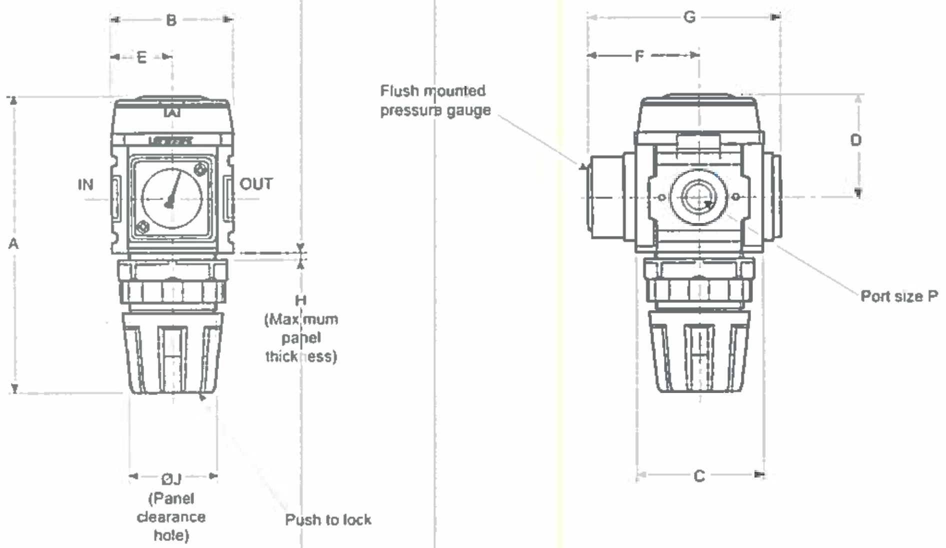


LR08-C2-F000



Characteristics and requirements for air line pressure regulators are in accordance with ISO 6953-1, *Pneumatic fluid power air line pressure regulators - Part 1.*

6. Installation dimensions in mm



Model code	A	B	C	D	E	F*	G*	H	J	P
LR08-C1-F000	100.1	40	42.7	34.3	20	36.8	64.3	3	32	G1/8"
LR08-C2-F000	100.1	40	42.7	34.3	20	36.8	64.3	3	32	G1/4"

* *For models without gauge dimension F = 21.3mm and dimension G = 42.7mm*

Note: - Panel mounting ring supplied as standard.

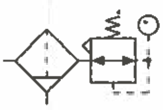
Filter / Regulators - LB08
1/8", 1/4" BSP

1. General description and application benefits

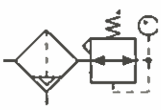
The integral Filter/Regulator air set combines all the advanced features and functions of the standard filter and regulator into a high performance unit. The LB08 models can be used where space and lower costs are required.

- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Available with unique flush mounted pressure gauge or without gauge. (Latter supplied with 2 off G1/8" ports for use as additional outlets or for fitting of back mounted gauges).
- Integral quick disconnect clear nylon bowl with guard.**
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbol



Manual drain



Automatic drain

** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

LB08 - C * - * * * 0
[1] [2] [3] [4]

[1] Thread size
1 = 1/8"
2 = 1/4"

[2] Diaphragm / Spring range
C = Self relieving / 0 - 2.1bar
D = Self relieving / 0 - 4.1bar
F = Self relieving / 0 - 8.5bar
P = Non relieving / 0 - 2.1bar
Q = Non relieving / 0 - 4.1bar
R = Non relieving / 0 - 8.5bar
(Code 'F' is standard)

[4] Options
0 = None
G = Pressure gauge

Note: 1) Unit without gauge has 2 off 1/8"BSP gauge ports.
2) Unit with gauge has 2 gauge mounting positions - one fitted with blanking plate.

[3] Bowl / Drain
K = Nylon with guard / Manual drain
L = Metal with sight glass / Manual drain
R = Nylon with guard / Automatic piston drain
S = Metal with sight glass / Automatic piston drain

Preferred model selection

LB08-C1-FKG0	Modular self relieving filter/regulator c/w gauge, manual drain & nylon bowl, 1/8"BSP
LB08-C1-FRG0	Modular self relieving filter/regulator c/w gauge, automatic drain & nylon bowl, 1/8"BSP
LB08-C1-FK00	Modular self relieving filter/regulator c/w manual drain & nylon bowl, 1/8"BSP
LB08-C1-FR00	Modular self relieving filter/regulator c/w automatic drain & nylon bowl, 1/8"BSP
LB08-C2-FKG0	Modular self relieving filter/regulator c/w gauge, manual drain & nylon bowl, 1/4"BSP
LB08-C2-FRG0	Modular self relieving filter/regulator c/w gauge, automatic drain & nylon bowl, 1/4"BSP
LB08-C2-FK00	Modular self relieving filter/regulator c/w manual drain & nylon bowl, 1/4"BSP
LB08-C2-FR00	Modular self relieving filter/regulator c/w automatic drain & nylon bowl, 1/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/8"BSP, self relieving regulator with 0 - 4.1bar (0 - 60psig) range spring and fitted with gauge, metal bowl and automatic drain. Order as LB08-C1-DSG0

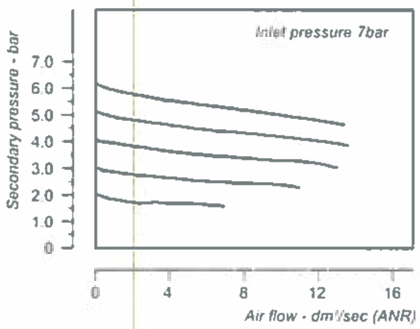
NOTE: For unit without pressure gauge order gauge separately - see page PG 1.1

4. Operating data

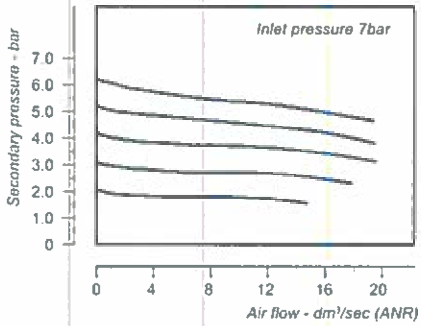
Maximum supply pressure	Nylon bowl Metal bowl	10bar (150psig) 17bar (250psig)
Adjustment range pressure	0 - 2.1bar (0 - 30 psig) 0 - 4.1bar (0 - 60 psig) 0 - 8.5bar (0 - 125 psig)	
Maximum operating temperature	Nylon bowl Metal bowl	52° C (125° F) 79° C (175° F)
Standard filtration	5 microns	
Retention capacity	12cm³	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LB08-C1-FK00 LB08-C2-FK00	13.5 dm³/sec (28.6 scfm) 19.9 dm³/sec (42.2 scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/8", 1/4"BSP	
Gauge ports (filter/regulator without gauge)	2 x 1/8"BSP	
Materials of construction	See page F 1.1 for filter unit components See page R 1.1 for regulator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 1.1	
Accessories	See page MA 1.1	
Port adaptors (when required)	1/8" 1/4", 3/8"BSP - See page MA 1.1	
Mass	0.34kg (0.75lb)	
Service kits	See page F 1.1 for filter unit components See page R 1.1 for regulator unit components	

5. Flow characteristics

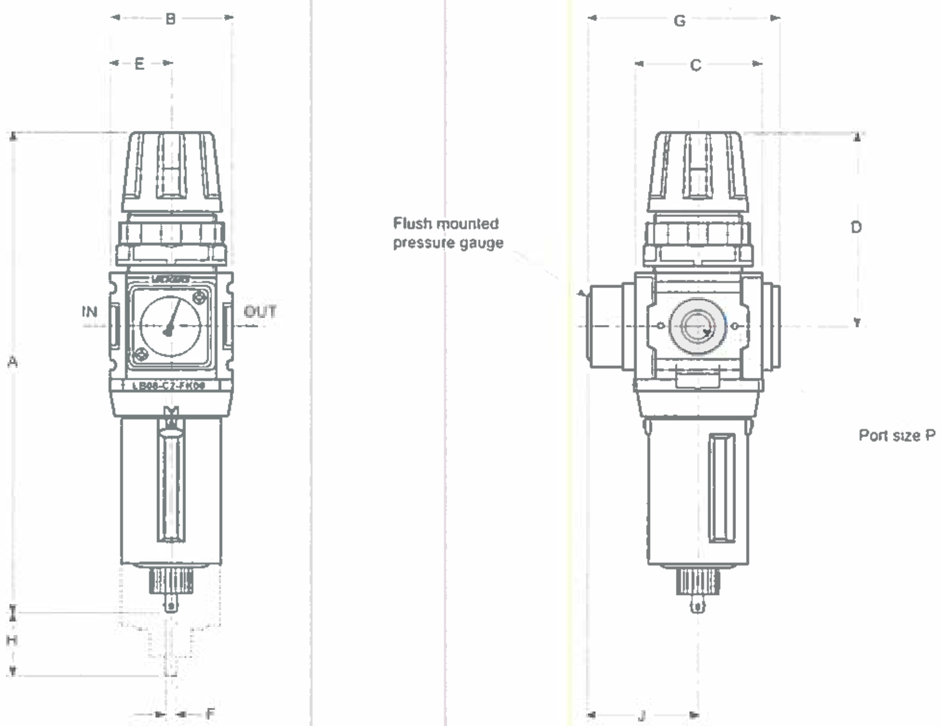
LB08-C1-FK00



LB08-C2-FK00



6. Installation dimensions in mm



Model code	A	B	C	D	E	F	G*	H	J*	P
LB08-C1-FK00	164.1	40	42.7	66	20	4mm I.D. tube barb fitting	64.3	33.3	36.8	G1/8"
LB08-C2-FK00	164.1	40	42.7	66	20	4mm I.D. tube barb fitting	64.3	33.3	36.8	G1/4"

* *For models without gauge dimension G = 42 7mm and dimension J = 21.3mm*

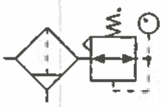
Filter / Regulators - LB28
3/8", 1/2", 3/4" BSP

1. General description and application benefits

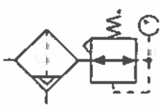
The integral Filter/Regulator air set combines all the advanced features and functions of the standard filter and regulator into a high performance unit. The LB28 models can be used where space and lower costs are required.

- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Available with or without pressure gauge - gauge supplied separately.
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbol



Manual drain



Automatic drain

** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

LB28 - C * - * * * 0

[1] [2] [3] [4]

[1] **Thread size**
- 3 = 3/8"
- 4 = 1/2"
- 6 = 3/4"

[2] **Diaphragm / Spring range**
- C = Self relieving / 0 - 1.7bar
- D = Self relieving / 0 - 4.2bar
- F = Self relieving / 0 - 8.5bar
- G = Self relieving / 0 - 17.1bar
- P = Non relieving / 0 - 1.7bar
- Q = Non relieving / 0 - 4.2bar
- R = Non relieving / 0 - 8.5bar
- S = Non relieving / 0 - 17.1bar

(Code 'F' is standard)

[4] **Options**
- 0 = None
- C = Tamper resistant regulator adjustment

[3] **Bowl / Drain**
- G = Polycarbonate with guard / Automatic drain
- H = Metal with sight glass / Automatic drain
- K = Polycarbonate with guard / Manual drain
- L = Metal with sight glass / Manual drain

Preferred model selection

LB28-C3-FK00	Modular self relieving filter/regulator with manual drain polycarbonate bowl, 3/8"BSP
LB28-C3-FG00	Modular self relieving filter/regulator with automatic drain polycarbonate bowl, 3/8"BSP
LB28-C4-FK00	Modular self relieving filter/regulator with manual drain polycarbonate bowl, 1/2"BSP
LB28-C4-FG00	Modular self relieving filter/regulator with automatic drain polycarbonate bowl, 1/2"BSP
LB28-C6-FK00	Modular self relieving filter/regulator with manual drain polycarbonate bowl, 3/4"BSP
LB28-C6-FG00	Modular self relieving filter/regulator with automatic drain polycarbonate bowl, 3/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/4"BSP, self relieving regulator with 0 - 4.2bar (0 - 60psig) range spring and fitted with metal bowl and automatic drain. Order as LB28-C6-DH00

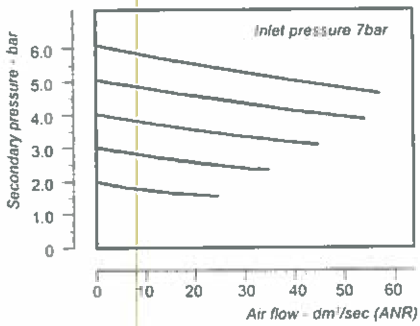
NOTE: Order pressure gauge separately - see page MA 3.1 and PG 1.1

4. Operating data

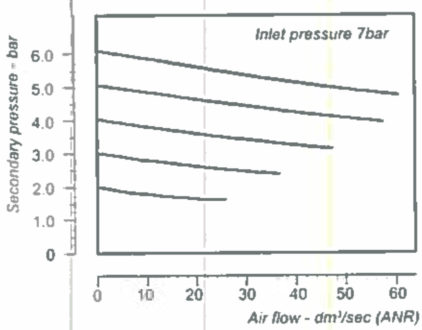
Maximum supply pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Adjustment range pressure	0 - 1.7bar (0 - 25 psig) 0 - 4.2bar (0 - 60 psig) 0 - 8.5bar (0 - 125 psig) 0 - 17.1bar (0 - 250psig)	
Maximum operating temperature	Polycarbonate bowl Metal bowl	52° C (125° F) 79° C (175° F)
Standard filtration	5 microns	
Retention capacity	84.9cm³	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LB28-C3-FK00 LB28-C4-FK00 LB28-C6-FK00	66.0 dm³/sec (140 scfm) 71.0 dm³/sec (150 scfm) 78.0 dm³/sec (165 scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	3/8", 1/2", 3/4"BSP	
Gauge ports	2 x 1/4"BSP	
Materials of construction	See page F 3.1 for filter unit components See page R 3.1 for regulator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 3.1	
Accessories	See page MA 3.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 3.1	
Mass	1.10kg (2.45lb)	
Service kits	See page F 3.1 for filter unit components See page R 3.1 for regulator unit components	

5. Flow characteristics

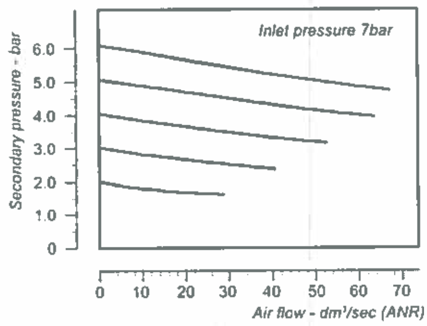
LB28-C3-FK00



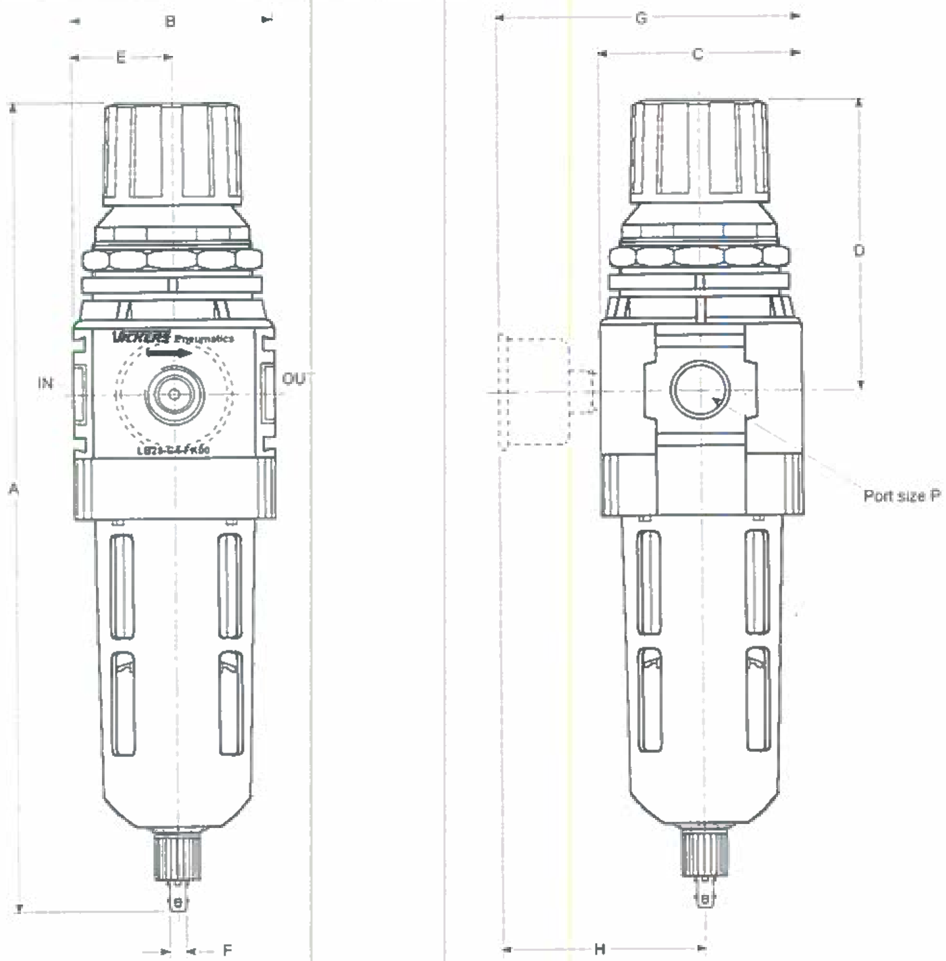
LB28-C4-FK00



LB28-C6-FK00



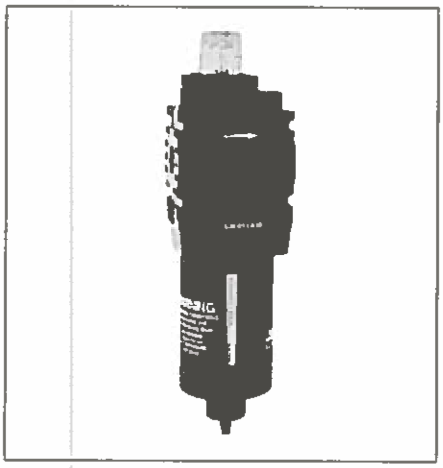
6. Installation dimensions in mm



Model code	A*	B	C†	D	E	F	G	H	P
LB28-C3-FK00	291	73	73	104	37	4.8mm I.D. tube barb fitting	108	72	G3/8"
LB28-C4-FK00	291	73	73	104	37	4.8mm I.D. tube barb fitting	108	72	G1/2"
LB28-C6-FK00	291	73	73	104	37	4.8mm I.D. tube barb fitting	108	72	G3/4"

* *For models with Auto Drain dimension A = 282mm.*
† *For models with Metal Bowls dimension C = 82mm*

Lubricators - LL08
1/8", 1/4" BSP



1. General description and application benefits

The LL08 series lubricator injects an oil mist into the flowing air stream of a pneumatic circuit to automatically provide the proper internal lubrication for air operated tools and other air operated devices.
The precise amount of oil to be delivered to the air stream is determined by the integral adjusting knob needle valve which sets the exact oil drip rate and can be adjusted without tools.
The self adjusting vane automatically maintains a constant oil to air ratio by opening and closing in response to a wide range of changing air flows.
A feature of the LL08 series lubricator is that it can be refilled without shutting off the air pressure.**

- Fill under pressure.
- High flow, high efficiency.
- Integral quick disconnect clear nylon bowl with guard.**
- Constant oil to air ratio.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbol

** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L L 0 8 - C $\underset{\boxed{1}}{*}$ - L $\underset{\boxed{2}}{*}$ $\underset{\boxed{3}}{*}$ 0

[1] **Thread size**
1 = 1/8"
2 = 1/4"

[2] **Bowl / Drain**
K = Nylon with guard / Manual drain
L = Metal with sight glass / Manual drain

[3] **Options**
0 = None
T = Tamper resistant adjustment

Preferred model selection

LL08-C1-LK00	Modular lubricator with nylon bowl and manual drain, 1/8"BSP
LL08-C2-LK00	Modular lubricator with nylon bowl and manual drain, 1/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/4"BSP, lubricator with metal bowl and manual drain and tamper resistant adjustment. Order as LL08-C2-LLT0

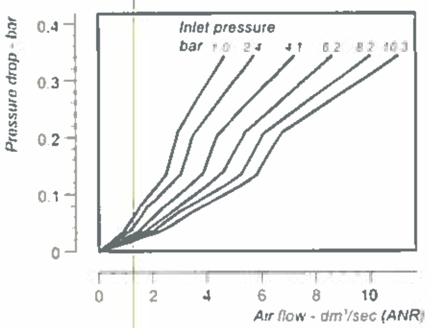
4. Operating data

Maximum operating pressure	Nylon bowl Metal bowl	10bar (150psig) 17bar (250psig)
Maximum operating temperature	Nylon bowl Metal bowl	52°C (125°F) 79°C (175°F)
Reservoir capacity	18 cm³	
Recommended lubrication	ISO VG32	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LL08-C1-LK00 LL08-C2-LK00	11.0 dm³/sec (23.56 scfm) 27.1 dm³/sec (57.5 scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/8", 1/4"BSP	
Materials of construction	Body - Zinc Body cap - ABS Bowl -Polyamid or Zinc Bowl guard - Polyamid Sight dome or sight gauge - Polyamid Seals - Nitrile (Nylon bowl) Fluorocarbon (Metal bowl)	
Installation dimensions	See overleaf	
Mountings	See page MA 1.1	
Accessories	Tamper resistant cap and See page MA 1.1	LRP-96-680
Port adaptors (when required)	1/8", 1/4", 3/8" BSP - See page MA 1.1	
Mass	0.35kg (0.77lb)	
Service kits† - Bowl assembly - Bowl 'O' ring - Siphon tube assembly - 'O' ring, fill plug	LRP-96-736 GRP-96-710 LRP-96-731 LRP-96-730	

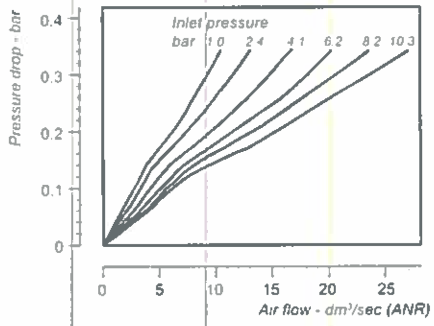
Notes: *† Part numbers given are for standard units with nylon bowls*
- For service kits relating to other variants contact Customer Services Department

5. Flow characteristics

LL08-C1-LK00

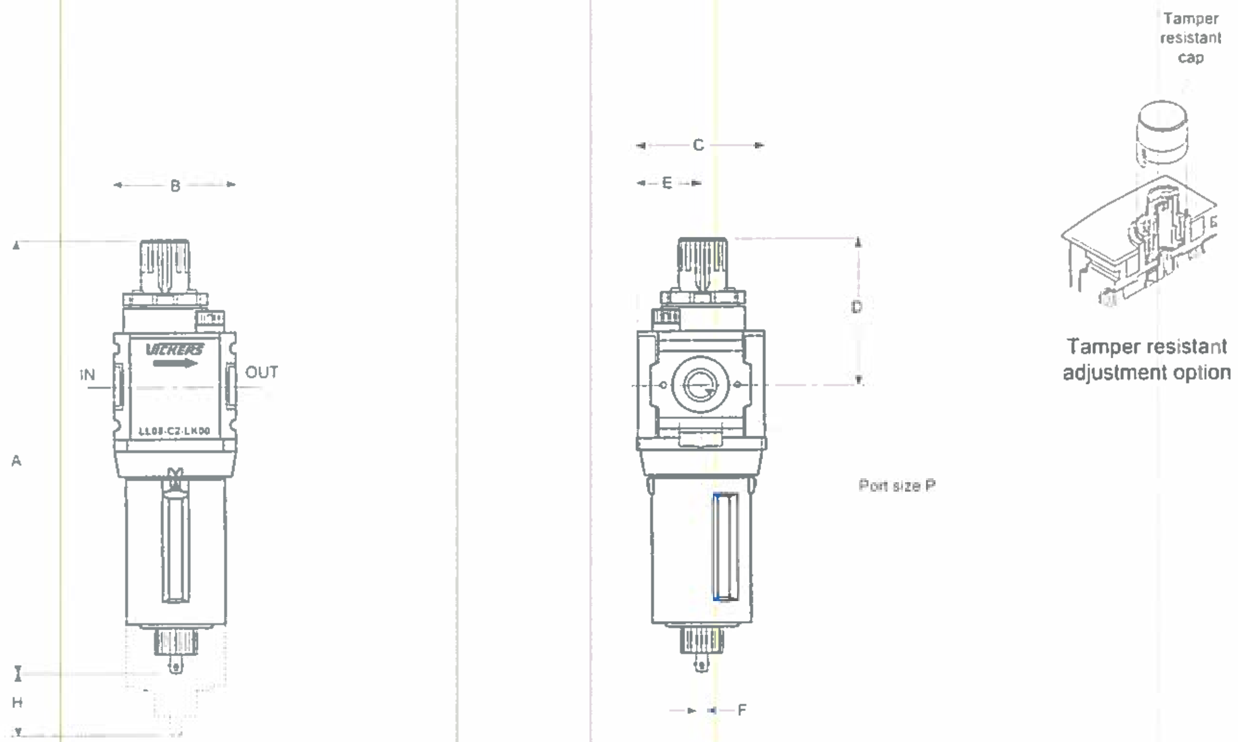


LL08-C2-LK00



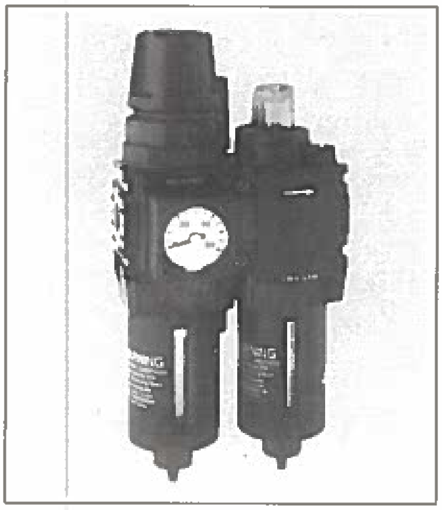
Characteristics and requirements for compressed air lubricators are in accordance with ISO 6301-1, *Pneumatic fluid power - Compressed air lubricators - Part 1.*

6. Installation dimensions in mm



Model code	A	B	C	D	E	F	H	P
LL08-C1-LK00	143.5	40	42.7	45.5	21.3	4mm I.D. tube barb fitting	58.2	G1/8"
LL08-C2-LK00	143.5	40	42.7	45.5	21.3	4mm I.D. tube barb fitting	58.2	G1/4"

Filter/Regulator, Lubricator combinations - LD-08
1/8", 1/4" BSP

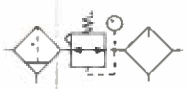


1. General description and application benefits

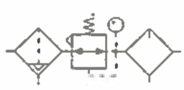
The LD08 modular combination models integrate all the unique features and advanced functions of the "08 Series" product line into a compact, lightweight and ready to mount assembly.
The units are pre-assembled utilizing modular joiner sets to facilitate easy installation and these are fitted with 'T' brackets for wall mounting of the combination unit.

- High flow, high efficiency.
- Self relieving **
  (Non relieving option available).
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or modular end blocks.
- Full range of accessories.
- Self adjusting oil feed.
- Can be withdrawn from the front.
- ***Available with our unique flush mounted pressure gauge.***

2. Functional symbol



Manual drain



Automatic drain

**** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

L D 0 8 - C * - * * * *

[1] [2] [3] [4]

[1] Thread size
1 = 1/8"
2 = 1/4"

[2] Diaphragm / Spring range
C = Self relieving / 0 - 2.1bar
D = Self relieving / 0 - 4.1bar
F = Self relieving / 0 - 8.5bar
P = Non relieving / 0 - 2.1bar
Q = Non relieving / 0 - 4.1bar
R = Non relieving / 0 - 8.5bar
(Code 'F' is standard)

[3] Bowls / Drains
K = Nylon with guard / Manual drain
L = Metal with sight glass / Manual drain
R = Nylon with guard / Automatic piston drain
S = Metal with sight glass / Automatic piston drain

[4] Options
0 = None
G = Pressure gauge
T = Tamper resistant lubricator adjustment
(If one option only is required use first position followed by '0'. For more than one option enter in alphabetical order)

Note: 1) Unit without gauge has 2 off 1/8"BSP gauge ports.
2) Unit with gauge has 2 gauge mounting positions - one fitted with blanking plate.

Preferred model selection

LD08-C1-FKG0	Modular FR/L combination c/w gauge, manual drains & nylon bowls, 1/8"BSP
LD08-C1-FRG0	Modular FR/L combination c/w gauge, automatic drains & nylon bowls, 1/8"BSP
LD08-C2-FKG0	Modular FR/L combination c/w gauge, manual drains & nylon bowls, 1/4"BSP
LD08-C2-FRG0	Modular FR/L combination c/w gauge, automatic drains & nylon bowls, 1/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

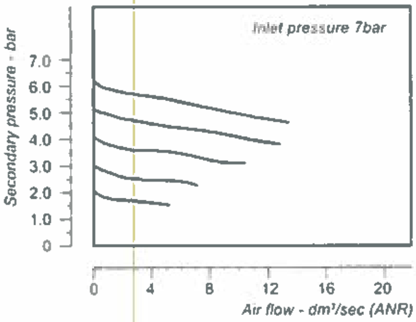
Example - For 1/8"BSP, self relieving filter/regulator with 0 - 4.1bar (0 - 60psig) range spring, nylon bowls with automatic drain. Order as LD08-C1-DR00

4. Operating data

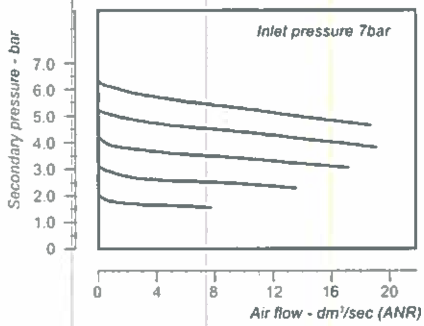
Maximum supply pressure	Nylon bowl Metal bowl	10bar (150psig) 17bar (250psig)
Adjustment range pressure	See filter/regulator unit - page B 1.1	
Maximum operating temperature	Nylon bowl Metal bowl	52° C (125° F) 79° C (175° F)
Standard filtration	5 microns	
Retention capacity (filter)	12 cm³	
Reservoir capacity (lubricator)	18 cm³	
Recommended lubrication	ISO VG32	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LD08-C1-FK00 LD08-C2-FK00	13.5 dm³/sec (28.6 scfm) 18.0 dm³/sec (38.1scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/8", 1/4"BSP	
Gauge ports (filter/regulator without gauge)	2 x 1/8"BSP	
Materials of construction	See page F 1.1 for filter unit components See page R 1.1 for regulator unit components See page L 1.1 for lubricator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 1.1	
Accessories	See page MA 1.1	
Port adaptors (when required)	1/8", 1/4", 3/8"BSP - See page MA 1.1	
Mass	0.65kg (1.43lb)	
Service kits	See individual units	

5. Flow characteristics

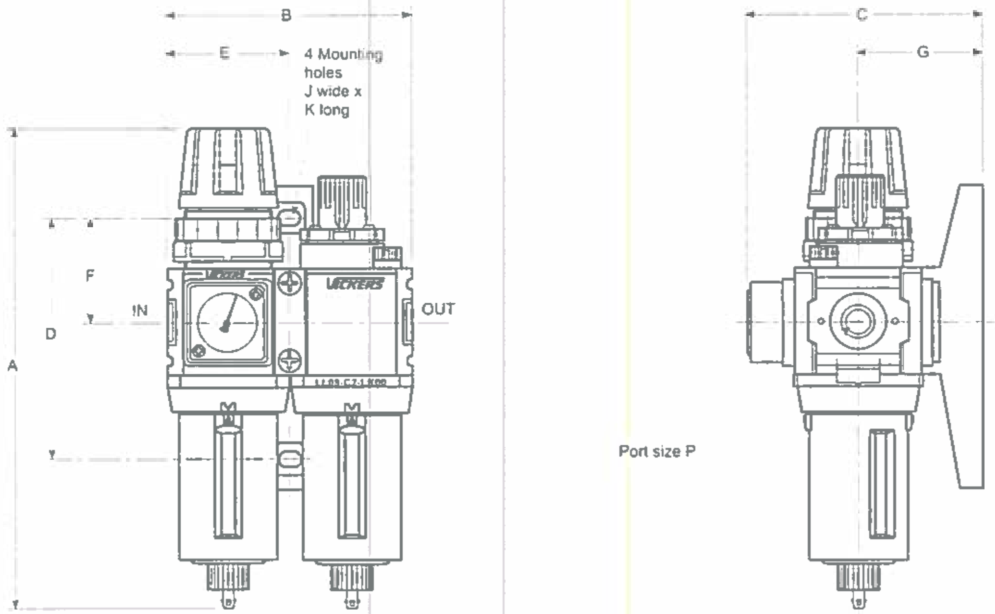
LD08-C1-FK00



LD08-C2-FK00

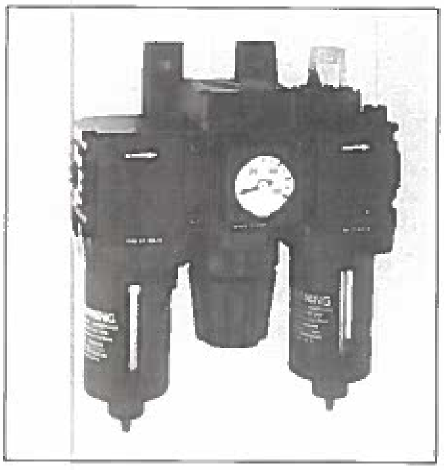


6. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	J	K	P
LD08-C1-FK00	164	80	77.7	80	40	34.8	40.9	5.5	7.5	G1/8"
LD08-C2-FK00	164	80	77.7	80	40	34.8	40.9	5.5	7.5	G1/4"

Filter, Regulator, Lubricator combinations - LC08
1/8", 1/4" BSP

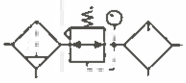


1. General description and application benefits

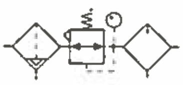
The LC08 modular combination models integrate all the unique features and advanced functions of the "08 Series" product line into a compact, lightweight and ready to mount assembly.
The units are pre-assembled utilizing modular joiner sets to facilitate easy installation and these are fitted with 'T' brackets for wall mounting of the combination unit.

- Integral quick disconnect clear nylon bowl with guard.**
- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or modular end blocks.
- Full range of accessories.
- Lubricator can be filled under pressure.**
- Can be withdrawn from the front.
- ***Unique flush mounted pressure gauge.***

2. Functional symbol



Manual drain



Automatic drain

**** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

LC08 - C * - * * * *

[1] [2] [3] [4]

[1] Thread size
1 = 1/8"
2 = 1/4"

[2] Diaphragm / Spring range
C = Self relieving / 0 - 2.1bar
D = Self relieving / 0 - 4.1bar
F = Self relieving / 0 - 8.5bar
P = Non relieving / 0 - 2.1bar
Q = Non relieving / 0 - 4.1bar
R = Non relieving / 0 - 8.5bar
(Code 'F' is standard)

[3] Bowls / Drains
K = Nylon with guard / Manual drain
L = Metal with sight glass / Manual drain
R = Nylon with guard / Automatic piston drain
S = Metal with sight glass / Automatic piston drain

[4] Options
0 = None
G = Pressure gauge
T = Tamper resistant lubricator adjustment
(If one option only is required use first position followed by '0'
For more than one option enter in alphabetical order)

Note: 1) Unit without gauge has 2 off 1/8"BSP gauge ports.
2) Unit with gauge has 2 gauge mounting positions - one fitted with blanking plate.

Preferred model selection

LC08-C1-FKG0	Modular F/R/L combination c/w gauge, manual drains & nylon bowls, 1/8"BSP
LC08-C1-FRG0	Modular F/R/L combination c/w gauge, automatic drains & nylon bowls, 1/8"BSP
LC08-C2-FKG0	Modular F/R/L combination c/w gauge, manual drains & nylon bowls, 1/4"BSP
LC08-C2-FRG0	Modular F/R/L combination c/w gauge, automatic drains & nylon bowls, 1/4"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

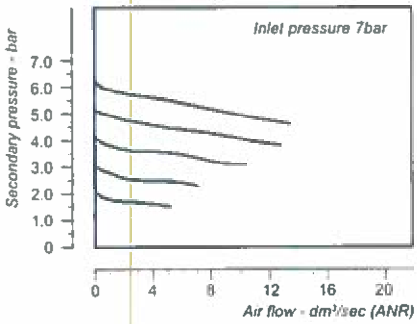
Example - For 1/4"BSP, filter with nylon bowl and manual drain, non relieving regulator with 0 - 8.5bar (0 - 125psig) range spring, fitted with pressure gauge and lubricator with nylon bowl and manual drain and fitted with tamper resistant kit. Order as LC08-C2-RKGT

4. Operating data

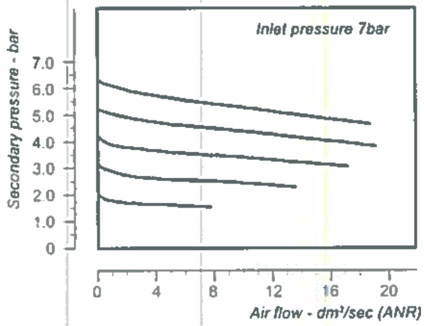
Maximum supply pressure	Nylon bowl Metal bowl	10bar (150psig) 17bar (250psig)
Adjustment range pressure	See regulator unit - page R 1.1	
Maximum operating temperature	Nylon bowl Metal bowl	52° C (125° F) 79° C (175° F)
Standard filtration	5 microns	
Retention capacity (filter)	12 cm^3	
Reservoir capacity (lubricator)	18 cm^3	
Recommended lubrication	ISO VG32	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LC08-C1-FK00 LC08-C2-FK00	13.5 dm^3/sec (28.6 scfm) 18.9 dm^3/sec (40.0 scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/8", 1/4"BSP	
Gauge ports (regulator without gauge)	2 x 1/8"BSP	
Materials of construction	See page F 1.1 for filter unit components See page R 1.1 for regulator unit components See page L 1.1 for lubricator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 1.1	
Accessories	See page MA 1.1	
Port adaptors (when required)	1/8", 1/4", 3/8"BSP - See page MA 1.1	
Mass	0.89kg (1.96lb)	
Service kits	See individual units	

5. Flow characteristics

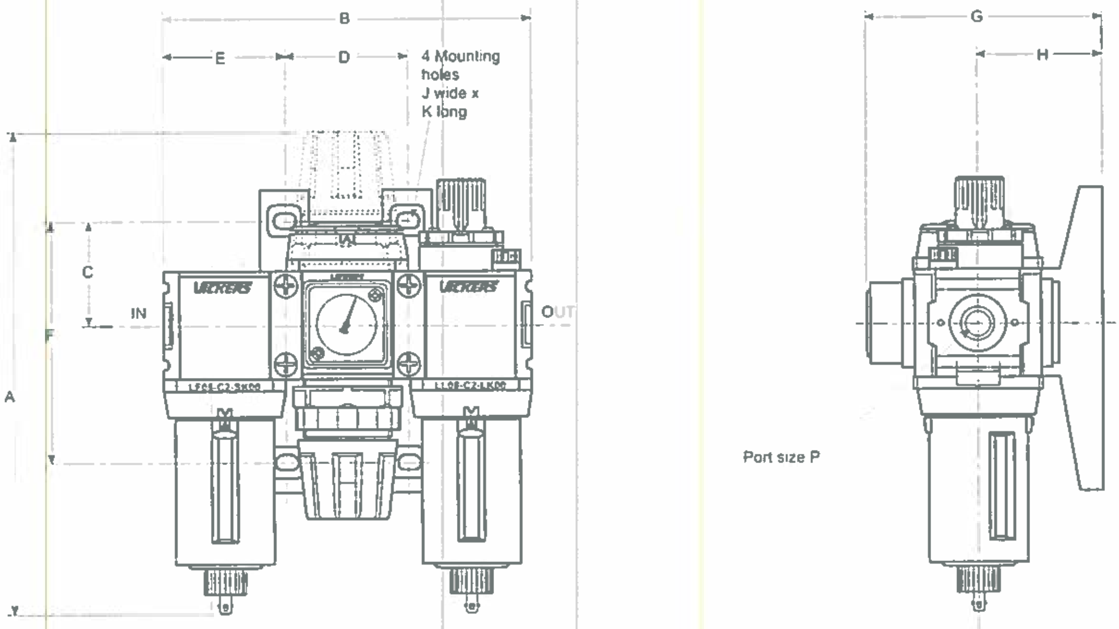
LC08-C1-FK00



LC08-C2-FK00



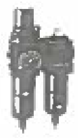
6. Installation dimensions in mm



Model code	A*	B	C	D	E	F	G	H	J	K	P
LC08-C1-FK00	164	120	34.8	40	40	80	78.2	40.9	5.5	7.5	G1/8"
LC08-C2-FK00	164	120	34.8	40	40	80	78.2	40.9	5.5	7.5	G1/4"

* *With regulator in inverted position (solid lines) maximum overall height A = 143.5mm*

18 Series 1/4", 3/8", 1/2" BSP

	Preferred model selection				Page numbers
	Port size	Model code	Description	Maximum flow	
Safety shut off/ exhaust valve	G1/4" G3/8" G1/2"	LV18-C2-0000 LV18-C3-0000 LV18-C4-0000	Manual Manual Manual	98 dm³/sec 102 dm³/sec 107 dm³/sec	E 2.1
Mounting accessories		GPA-96-601 GPA-96-603 GPA-96-606	Joiner set T Bracket + J set L Bracket		MA 2.1
Gauges	R1/4" R1/4"	F2615-4 F2615-10	0 - 4 bar 0 - 10 bar		MA 2.1
Particle filters	G1/4" G1/4" G3/8" G3/8" G1/2" G1/2"	LF18-C2-SK00 LF18-C2-SG00 LF18-C3-SK00 LF18-C3-SG00 LF18-C4-SK00 LF18-C4-SG00	Manual drain Auto drain Manual drain Auto drain Manual drain Auto drain	47.2 dm³/sec 47.2 dm³/sec 52.0 dm³/sec 52.0 dm³/sec 57.0 dm³/sec 57.0 dm³/sec	F 2.1 F 2.2
Coalescing filters	G1/4" G1/4" G3/8" G3/8" G1/2" G1/2"	LM18-C2-CK00 LM18-C2-CG00 LM18-C3-CK00 LM18-C3-CG00 LM18-C4-CK00 LM18-C4-CG00	Manual drain Auto drain Manual drain Auto drain Manual drain Auto drain	25.9 dm³/sec 25.9 dm³/sec 28.3 dm³/sec 28.3 dm³/sec 32.0 dm³/sec 32.0 dm³/sec	M 2.1 M 2.2
Regulators	G1/4" G1/4" G3/8" G3/8" G1/2" G1/2"	LR18-C2-F000 LR18-C2-R000 LR18-C3-F000 LR18-C3-R000 LR18-C4-F000 LR18-C4-R000	Self relieving Non relieving Self relieving Non relieving Self relieving Non relieving	49.0 dm³/sec 49.0 dm³/sec 50.4 dm³/sec 50.4 dm³/sec 60.0 dm³/sec 60.0 dm³/sec	R 2.1 R 2.2
Filter Regulators	G1/4" G1/4" G3/8" G3/8" G1/2" G1/2"	LB18-C2-FK00 LB18-C2-FG00 LB18-C3-FK00 LB18-C3-FG00 LB18-C4-FK00 LB18-C4-FG00	Manual drain Auto drain Manual drain Auto drain Manual drain Auto drain	47.1 dm³/sec 47.1 dm³/sec 49.5 dm³/sec 49.5 dm³/sec 58.9 dm³/sec 58.9 dm³/sec	B 2.1 B 2.2
Lubricators	G1/4" G3/8" G1/2"	LL18-C2-LK00 LL18-C3-LK00 LL18-C4-LK00	Manual drain Manual drain Manual drain	41.5 dm³/sec 42.4 dm³/sec 45.3 dm³/sec	L 2.1 L 2.2
Filter/Regulator, Lubricator combinations 	G1/4" G1/4" G3/8" G3/8" G1/2" G1/2"	LD18-C2-FKG0 LD18-C2-FGG0 LD18-C3-FKG0 LD18-C3-FGG0 LD18-C4-FKG0 LD18-C4-FGG0	Manual drain Auto drain Manual drain Auto drain Manual drain Auto drain	49.0 dm³/sec 49.0 dm³/sec 50.4 dm³/sec 50.4 dm³/sec 58.9 dm³/sec 58.9 dm³/sec	D 2.1 D 2.2
Filter, Regulator, Lubricator combinations	G1/4" G1/4" G3/8" G3/8" G1/2" G1/2"	LC18-C2-FKG0 LC18-C2-FGG0 LC18-C3-FKG0 LC18-C3-FGG0 LC18-C4-FKG0 LC18-C4-FGG0	Manual drain Auto drain Manual drain Auto drain Manual drain Auto drain	49.0 dm³/sec 49.0 dm³/sec 50.4 dm³/sec 50.4 dm³/sec 58.9 dm³/sec 58.9 dm³/sec	C 2.1 C 2.2
Slow start valve	G1/4" G1/4" G3/8" G3/8" G1/2" G1/2"	LS18-C2-A000 LS18-C2-E0†† LS18-C3-A000 LS18-C3-E0†† LS18-C4-A000 LS18-C4-E0††	Air operated Solenoid op Air operated Solenoid op Air operated Solenoid op	44.8 dm³/sec 44.8 dm³/sec 47.6 dm³/sec 47.6 dm³/sec 53.3 dm³/sec 53.3 dm³/sec	SS 2.1 SS 2.2
	Note: †† = Voltage code - to be specified at time of ordering				
Emergency stop valve with slow start	G1/4" G3/8" G1/2"	LE18-C2-E0†† LE18-C3-E0†† LE18-C4-E0††	With solenoid op With solenoid op With solenoid op	44.8 dm³/sec 47.6 dm³/sec 53.3 dm³/sec	ES 2.1 ES 2.2
	Note: †† = Voltage code - to be specified at time of ordering				
Options	Metal bowls with sight glass Alternative filter elements Non relieving and reverse flow regulators Low and high pressure springs Tamper resistant kits for regulators and lubricators				See relevant product pages
	Modular end blocks - 1/4", 3/8", 1/2", 3/4" BSP				MA 2.1

Extract from:-

EN 983 : 1994 *(Final draft)* - Safety requirements for fluid power systems and their components - Pneumatics.

"Scope

This standard applies to pneumatic systems and their components on machinery.

It identifies hazards and factors which affect the safety of systems and their components when they are put to their intended use.

Gas bottles and receivers are excluded from the scope of this standard. For receivers see EN286-1.

The principles specified apply to the design, construction and modification of new systems and their components and aspects of use including:

- assembly
- installation
- adjustment
- operation
- cleaning and
- maintenance

Components are covered in the standard, but only to the extent that safety requirements are given to allow the components to be safely integrated into the system design.

The standard applies to systems and their components on machinery that are manufactured after the date of the adoption of this standard."

Safety shut off / exhaust valve - LV18
1/4", 3/8", 1/2"BSP

1. General description and application benefits

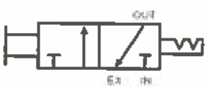
Manually operated slide type 3 way valve of modular design for installation immediately upstream of any filter, filter/regulator or FRL units. Valve is secured to unit by means of joiner set.

In the closed position downstream air is exhausted to atmosphere. Particularly useful for isolating and depressurizing downstream units requiring maintenance or replacement.

Push / push operation gives positive open and closed positions. The valve slide can be locked in the closed position with a user supplied padlock.

- Slide valve construction.
- Downstream air exhausted in closed position. **
- High flow, high efficiency.
- Push / push action.
- Readily identifiable by bright orange colour of slide mechanism.
- Display provides visual check.
- Pad lockable in closed position. **

2. Functional symbol



** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.

3. Preferred model selection

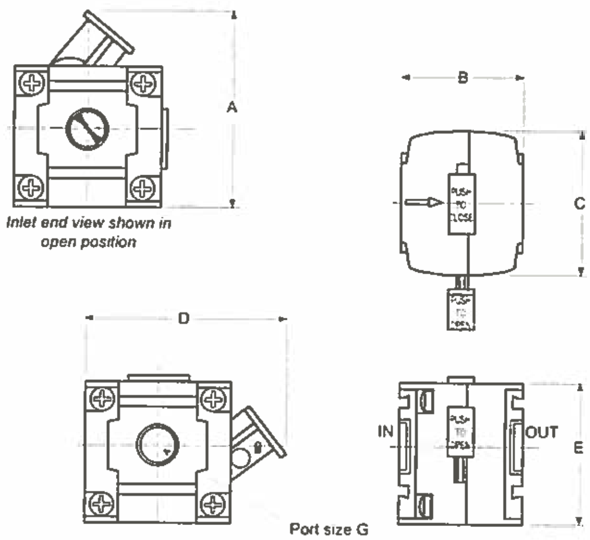
LV18-C2-0000	Modular safety shut off valve, manually operated, 1/4"BSP
LV18-C3-0000	Modular safety shut off valve, manually operated, 3/8"BSP
LV18-C4-0000	Modular safety shut off valve, manually operated, 1/2"BSP

4. Operating data

Maximum operating pressure	10bar (150psig)
Maximum operating temperature	79°C (175°F)
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LV18-C2-0000 98dm³/sec (208scfm) LV18-C3-0000 102dm³/sec (216scfm) LV18-C4-0000 107dm³/sec (227scfm)
Exhaust flow *	Kv = 14.7 (Cv = 1.03)
Type of connection	Screwthread
Thread size	1/4", 3/8", 1/2"BSP
Materials of construction	Body - Zinc Blade - Acetal Seals - Nitrile
Installation dimensions	See below
Mountings	See page MA 2.1
Accessories	See page MA 2.1
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 2.1
Mass	0.34kg (0.74lb)
Service kits	Replace unit

*Note: * Kv (Cv) is for model LV18-C3-0000 at inlet pressure of10bar (150 psig)*

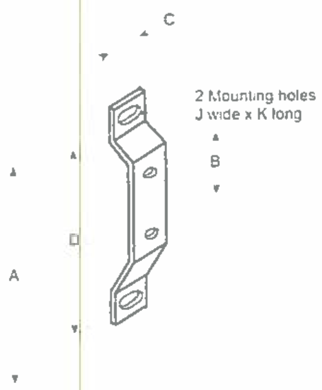
5. Installation dimensions in mm



Model code	A	B	C	D	E	G
LV18-C2-0000	80	49	60	80	58	G1/4"
LV18-C3-0000	80	49	60	80	58	G3/8"
LV18-C4-0000	80	49	60	80	58	G1/2"

Mountings and accessories

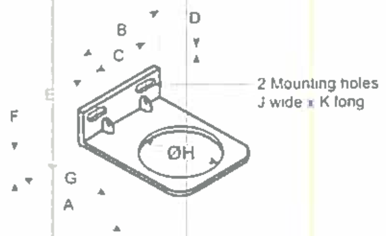
T Bracket



Part number	A	B	C	D	J	K
GPA-96-602	95	32	19.3	83	7.1	14

L Bracket

For LR18 series regulators and LB18 series filter / regulators

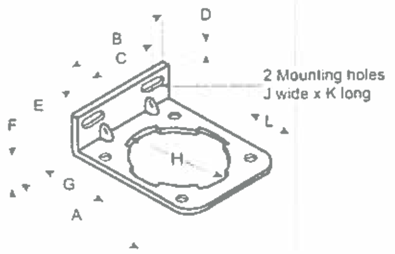


Part number	A	B	C	D	E
GPA-96-606	69.5	69.5	42	11	14

F	G	H	J	K
25	40	51	7.1	14

C Bracket

For LF18 series filters, LM18 series coalescing filters and LL18 series lubricators

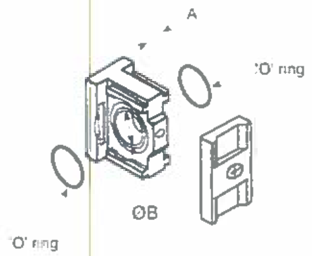


Supplied complete with 2 off self tapping mounting screws for fixing bracket to component

Part number	A	B	C	D	E
GPA-96-604	72	69.5	42	11	14

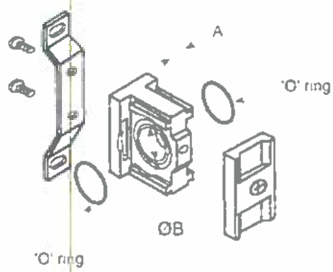
F	G	H	J	K	L
25	32	57	7.1	14	22

Joiner set



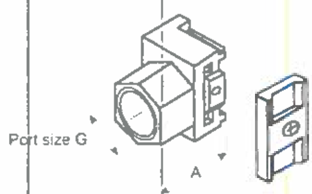
Part number	A	B
GPA-96-601	8.9	22.1

Joiner set also available with T bracket:-



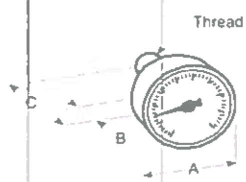
Part number	A	B
GPA-96-603	8.9	22.1

End block



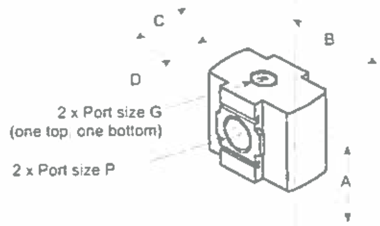
Part number	A	G
GPA-96-620	40	G 1/4"
GPA-96-621	40	G 3/8"
GPA-96-622	40	G 1/2"
GPA-96-623	40	G 3/4"

Gauge



Part number	Range	A	B	C	D
F2615 - 4	0 - 4bar	50	28	46	R1/4"
F2615 - 10	0 - 10bar	50	28	46	R1/4"

Distributor block



Standard distributor block:-

Part number	A	B	C	D	G	P
LN18-C4-0000	48	60	48	24	G3/8"	G1/2"

Distributor block with check valve:-

Part number	A	B	C	D	G	P
LN18-C4-C000	48	60	60	24	G3/8"	G1/2"

Options with Port 'G' diameters of 1/4" and 1/2" are also available - to special order

Operating data

Maximum operating pressure	21bar (300 psig)
Maximum operating temperature	79°C (175°F)
Maximum flow*	189 dm³/sec (400scfm)
Type of connection	Screwthread
Materials of construction	Body - Aluminium Check valve - Nitrile
Mass LN18-C4-0000 LN18-C4-C000	0.26kg (0.57lb) 0.35kg (0.77lb)

* *Value based at inlet pressure of 10 bar and pressure drop of 0.3bar*

Particle filters - LF18
1/4", 3/8", 1/2" BSP

1. General description and application benefits

High performance filters designed to remove solid and liquid contaminants from compressed air lines.

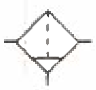
The LF18 filter utilizes a 5 micron sintered polypropylene element giving superior filtration results.

Metal bowl options, with sight glass, are available.

All filters are available with manual drain as standard or optionally with automatic mechanical drain.

- High flow, high efficiency.
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Corrosion resistant nylon bowl guard with all round view slots.
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbols



Manual drain

Automatic drain

** **Conforms to EN 983 : 1994 *(Final draft)***
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L F 1 8 - C * - S * 0 0
[1] [2] [3]

[1] **Thread size**
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] **Element**
S = 5 micron

[3] **Bowl / Drain**
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

Preferred model selection

LF18-C2-SK00	Modular particle filter with polycarbonate bowl and manual drain, 1/4"BSP
LF18-C2-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 1/4"BSP
LF18-C3-SK00	Modular particle filter with polycarbonate bowl and manual drain, 3/8"BSP
LF18-C3-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 3/8"BSP
LF18-C4-SK00	Modular particle filter with polycarbonate bowl and manual drain, 1/2"BSP
LF18-C4-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 1/2"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 3/8"BSP, particle filter with metal bowl and automatic drain.
Order as LF18-C3-SH00

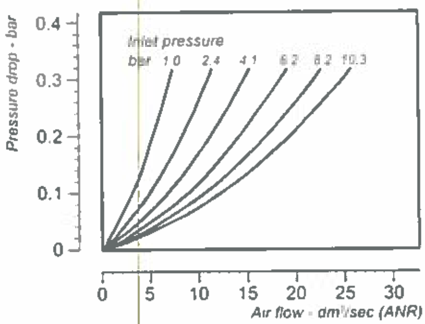
4. Operating data

Maximum operating pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Maximum operating temperature	Polycarbonate bowl Metal bowl	52°C (125°F) 79°C (175°F)
Standard filtration	5 micron	
Retention capacity	50.9 cm^3	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LF18-C2-SK00 LF18-C3-SK00 LF18-C4-SK00	47.2 dm^3/sec (100scfm) 52.0 dm^3/sec (110scfm) 57.0 dm^3/sec (120scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Materials of construction	Body - Zinc Body cap - ABS Bowl - Polycarbonate or Zinc Bowl guard - Polyamid Element - Sintered polypropylene Seals - Nitrile (Polycarbonate bowl) Fluorocarbon (Metal bowl)	
Installation dimensions	See overleaf	
Mountings	See page MA 2.1	
Accessories	See page MA 2.1	
Port adaptors (when required)	1/4", 3/8",1/2", 3/4" BSP - See page MA 2.1	
Mass	0.50kg (1.08lb)	
Service kits† - Replacement element	FRP-96-639	
- Retainer element baffle	FRP-96-641	
- Bowl assembly	GRP-96-634 (Manual drain) GRP-96-635 (Automatic drain)	
- Manual drain	GRP-96-685	
- Bowl 'O' ring	GRP-96-640	

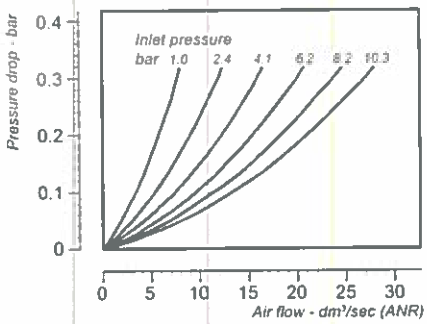
Notes: *† Part numbers given are for standard units with polycarbonate bowls*
- For service kits relating to other variants contact Customer Services Department.

5. Flow characteristics

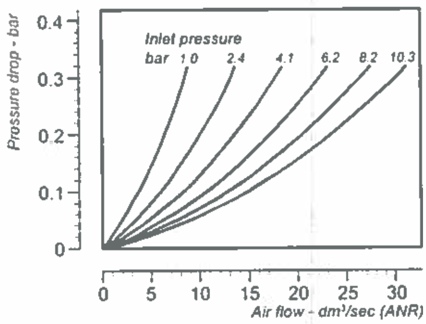
LM18-C2-CK00



LM18-C3-CK00

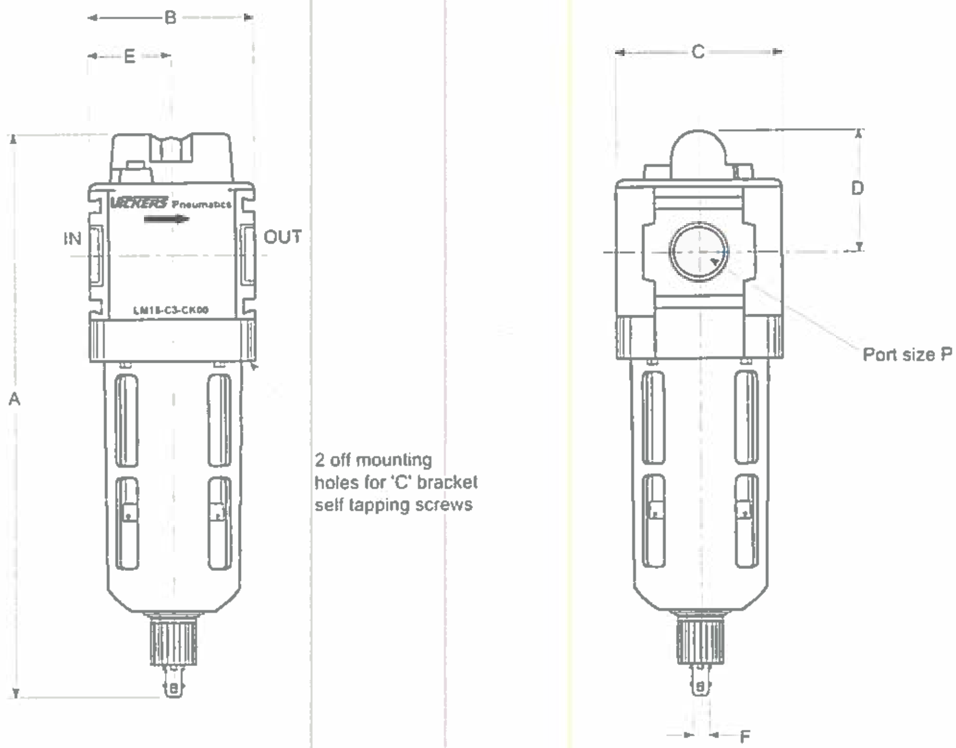


LM18-C4-CK00



Characteristics and requirements for compressed air filters are in accordance with ISO 5782-1, *Pneumatic fluid power - Compressed air filters - Part 1.*

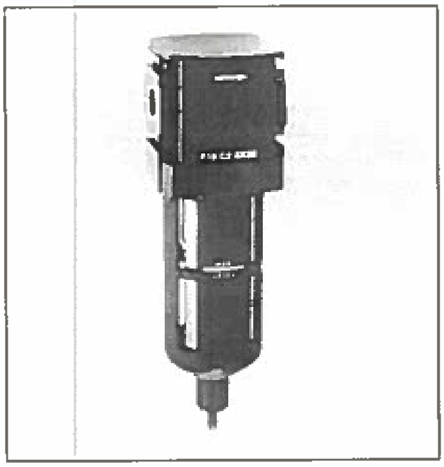
6. Installation dimensions in mm



Model code	A*	B	C†	D	E	F	P
LM18-C2-CK00	209	60	60	48	30	4.8mm I.D. tube barb fitting	G1/4"
LM18-C3-CK00	209	60	60	48	30	4.8mm I.D. tube barb fitting	G3/8"
LM18-C4-CK00	209	60	60	48	30	4.8mm I.D. tube barb fitting	G1/2"

* *For models with Auto Drain dimension A = 200mm*
† *For models with Metal Bowls dimension C = 69mm*

Particle filters - LF18
1/4", 3/8", 1/2" BSP



1. General description and application benefits

High performance filters designed to remove solid and liquid contaminants from compressed air lines.

The LF18 filter utilizes a 5 micron sintered polypropylene element giving superior filtration results.

Metal bowl options, with sight glass, are available.

All filters are available with manual drain as standard or optionally with automatic mechanical drain.

- High flow, high efficiency.
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Corrosion resistant nylon bowl guard with all round view slots.
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbols

** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

LF18 - C * - S * 00

[1] [2] [3]

[1] **Thread size**
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] **Element**
S = 5 micron

[3] **Bowl / Drain**
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

Preferred model selection

LF18-C2-SK00	Modular particle filter with polycarbonate bowl and manual drain, 1/4"BSP
LF18-C2-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 1/4"BSP
LF18-C3-SK00	Modular particle filter with polycarbonate bowl and manual drain, 3/8"BSP
LF18-C3-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 3/8"BSP
LF18-C4-SK00	Modular particle filter with polycarbonate bowl and manual drain, 1/2"BSP
LF18-C4-SG00	Modular particle filter with polycarbonate bowl and automatic drain, 1/2"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

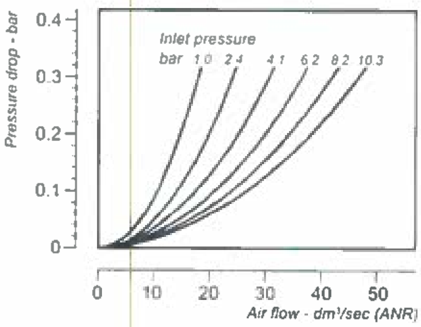
Example - For 3/8"BSP, particle filter with metal bowl and automatic drain. Order as LF18-C3-SH00

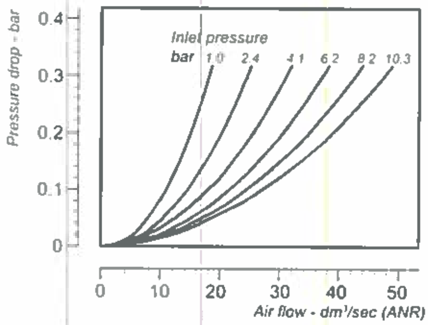
4. Operating data

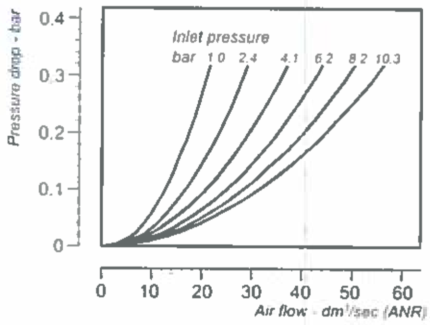
Maximum operating pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Maximum operating temperature	Polycarbonate bowl Metal bowl	52°C (125°F) 79°C (175°F)
Standard filtration	5 micron	
Retention capacity	50.9 cm^3	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LF18-C2-SK00 LF18-C3-SK00 LF18-C4-SK00	47.2 dm^3/sec (100scfm) 52.0 dm^3/sec (110scfm) 57.0 dm^3/sec (120scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Materials of construction	Body - Zinc Body cap - ABS Bowl - Polycarbonate or Zinc Bowl guard - Polyamid Element - Sintered polypropylene Seals - Nitrile (Polycarbonate bowl) Fluorocarbon (Metal bowl)	
Installation dimensions	See overleaf	
Mountings	See page MA 2.1	
Accessories	See page MA 2.1	
Port adaptors (when required)	1/4", 3/8",1/2", 3/4" BSP - See page MA 2.1	
Mass	0.50kg (1.08lb)	
Service kits† - Replacement element - Retainer element baffle - Bowl assembly - Manual drain - Bowl 'O' ring	FRP-96-639 FRP-96-641 GRP-96-634 (Manual drain) GRP-96-635 (Automatic drain) GRP-96-685 GRP-96-640	

Notes: *† Part numbers given are for standard units with polycarbonate bowls*
- For service kits relating to other variants contact Customer Services Department.

5. Flow characteristics

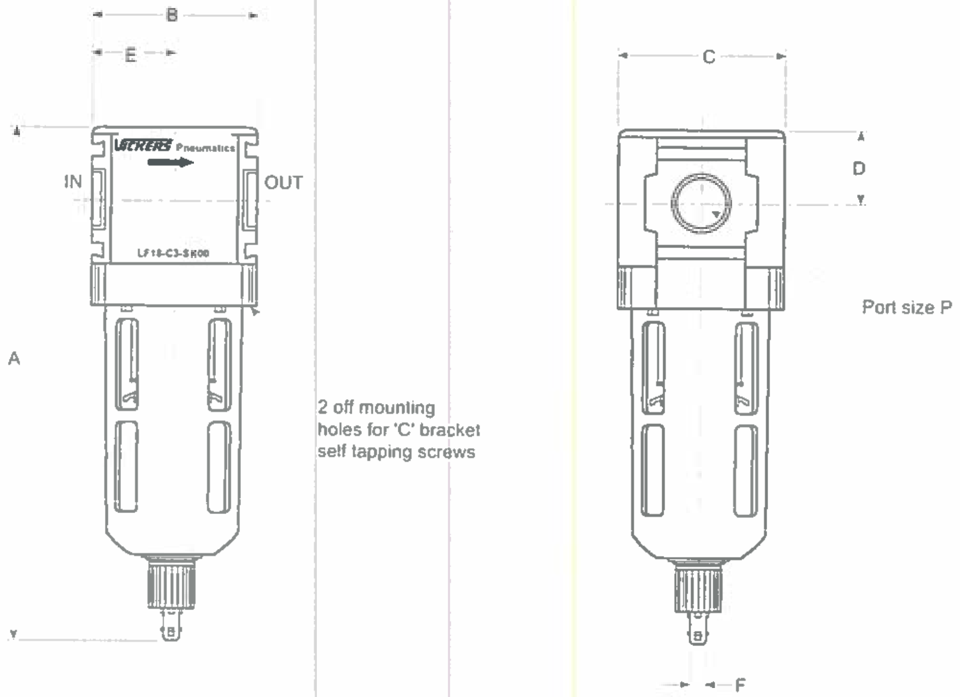






Characteristics and requirements for compressed air filters are in accordance with ISO 5782-1, *Pneumatic fluid power - Compressed air filters - Part 1.*

6. Installation dimensions in mm



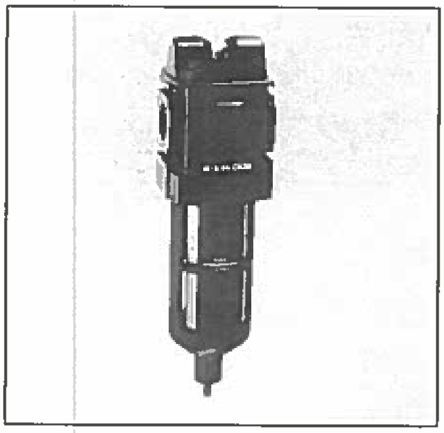
Model code	A*	B	C†	D	E	F	P
LF18-C2-SK00	188	60	60	26	30	4.8mm I.D. tube barb fitting	G1/4"
LF18-C3-SK00	188	60	60	26	30	4.8mm I.D. tube barb fitting	G3/8"
LF18-C4-SK00	188	60	60	26	30	4.8mm I.D. tube barb fitting	G1/2"

* *For models with Auto Drain dimension A = 179mm.*
† *For models with Metal Bowls dimension C = 69mm*

VICKERS

Pneumatics

Coalescing filters - LM18
1/4", 3/8", 1/2" BSP



1. General description and application benefits

High performance coalescing filters for removal of water and oil aerosols and solid particulate contaminants down to 0.1 ppm mg/m^3
The standard LM18 filters utilize a 0.01 micron borosilicate cloth element with options of 0.5 micron in the same material or 0.003 micron activated carbon elements.
Metal bowl options, with sight glass, are available.
All filters are available with manual drain as standard or optionally with automatic mechanical drain.
It is recommended that the LF18 standard 5 micron filter is installed upstream of the LM18 coalescing filter to maximize the service life of the coalescing filter element.

- High flow, high efficiency.
- Differential pressure indicator fitted as standard.**
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Corrosion resistant nylon bowl guard with all round view slot.
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbols

** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L M 1 8 - C * - * * 0 0

[1] [2] [3]

[1] **Thread size**
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] **Element**
B = 0.5 micron (optional)
C = 0.01 micron (standard)
D = Activated carbon (optional)

[3] **Bowl / Drain**
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

3. Preferred model selection

LM18-C2-CK00	Modular coalescing filter with polycarbonate bowl and manual drain, 1/4"BSP
LM18-C2-CG00	Modular coalescing filter with polycarbonate bowl and automatic drain, 1/4"BSP
LM18-C3-CK00	Modular coalescing filter with polycarbonate bowl and manual drain, 3/8"BSP
LM18-C3-CG00	Modular coalescing filter with polycarbonate bowl and automatic drain, 3/8"BSP
LM18-C4-CK00	Modular coalescing filter with polycarbonate bowl and manual drain, 1/2"BSP
LM18-C4-CG00	Modular coalescing filter with polycarbonate bowl and automatic drain, 1/2"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/2"BSP, coalescing filter with 0.5micron element, polycarbonate bowl and automatic drain. Order as LM18-C4-BG00

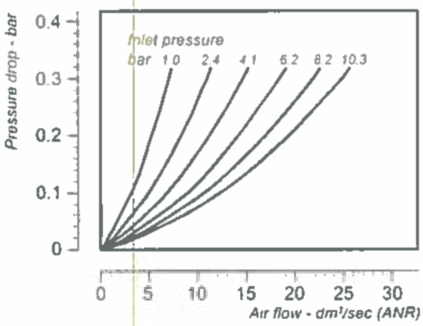
4. Operating data

Maximum operating pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 10bar (150psig)
Maximum operating temperature	Polycarbonate bowl Metal bowl	52°C (125°F) 79°C (175°F)
Standard filtration	0.003, 0.01 or 0.5 micron	
Retention capacity	50.9 cm^3	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LM18-C2-CK00 LM18-C3-CK00 LM18-C4-CK00	25.9 dm^3/sec (55scfm) 28.3 dm^3/sec (60scfm) 32.0 dm^3/sec (67scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Materials of construction	Body - Zinc Body cap - ABS Bowl - Polycarbonate or Zinc Bowl guard - Polyamid Element - Borosilicate cloth (type B,C) Activated carbon (type D) Seals - Fluorocarbon	
Installation dimensions	See overleaf	
Mountings	See page MA 2.1	
Accessories	See page MA 2.1	
Port adaptors (when required)	1/4", 3/8",1/2", 3/4" BSP - See page MA 2.1	
Mass	0.50kg (1.10lb)	
Service kits † - Replacement element	MSP-96-647 (0.5 micron) MTP-96-646 (0.01 micron)	
- Bowl assembly	GRP-96-634 (Manual drain) GRP-96-635 (Automatic drain)	
- Manual drain	GRP-96-685	
- Bowl 'O' ring	GRP-96-754	

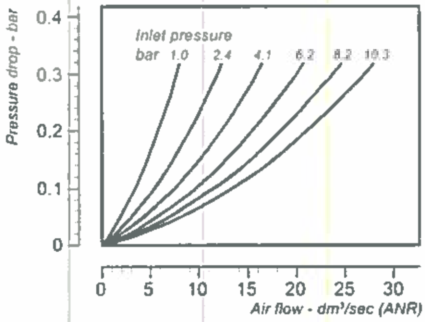
Notes: † Part numbers given are for standard units with polycarbonate bowls
- For service kits relating to other variants contact Customer Services Department.

5. Flow characteristics

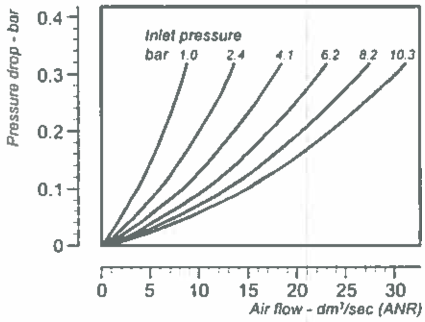
LM18-C2-CK00



LM18-C3-CK00

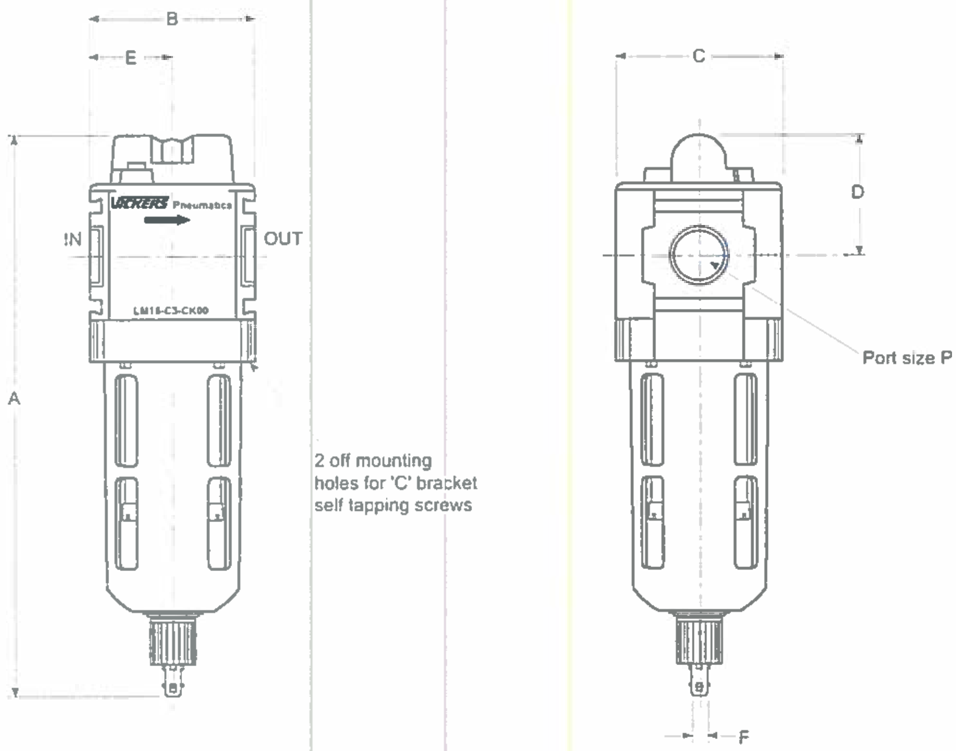


LM18-C4-CK00



Characteristics and requirements for compressed air filters are in accordance with ISO 5782-1, *Pneumatic fluid power - Compressed air filters - Part 1.*

6. Installation dimensions in mm



Model code	A*	B	C†	D	E	F	P
LM18-C2-CK00	209	60	60	48	30	4.8mm I.D. tube barb fitting	G1/4"
LM18-C3-CK00	209	60	60	48	30	4.8mm I.D. tube barb fitting	G3/8"
LM18-C4-CK00	209	60	60	48	30	4.8mm I.D. tube barb fitting	G1/2"

* *For models with Auto Drain dimension A = 200mm*
† *For models with Metal Bowls dimension C = 69mm*

Pneumatics

Regulators - LR18
1/4", 3/8", 1/2" BSP

1. General description and application benefits

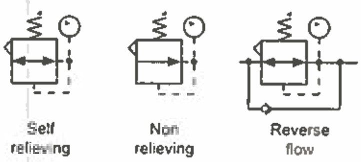
Spring loaded diaphragm type regulators featuring a balanced valve for superior regulation characteristics.

The LR18 regulators are provided with 2 off G1/4" gauge ports which can also be used as additional regulator outlets if no pressure gauge is required.

The standard LR18 model is self relieving with non relieving available as an option.

- High flow, high efficiency.
- Self relieving **
  (Non relieving option available)
- Available with or without pressure gauge - gauge supplied separately.
- Integral body thread or port adaptors.
- Full range of accessories.
- Non rising adjustment.
- Available with full reverse flow function.

2. Functional symbols



** **Conforms to EN 983 : 1994 *(Final draft)***
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L R 1 8 - C * - * 0 * *

[1] [2] [3]

[1] Thread size
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] Diaphragm / Spring range
C = Self relieving / 0 - 1.7bar
D = Self relieving / 0 - 4.2bar
F = Self relieving / 0 - 8.5bar
G = Self relieving / 0 - 17.1bar
P = Non relieving / 0 - 1.7bar
Q = Non relieving / 0 - 4.2bar
R = Non relieving / 0 - 8.5bar
S = Non relieving / 0 - 17.1bar
(Codes 'F' and 'R' are standard)

[3] Options
0 = None
C = Tamper resistant adjustment
R = Reverse flow
(If one option only is required use first position followed by '0'. For more than one option enter in alphabetical order)

Preferred model selection

LR18-C2-F000	Modular self relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 1/4"BSP
LR18-C2-R000	Modular non relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 1/4"BSP
LR18-C3-F000	Modular self relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 3/8"BSP
LR18-C3-R000	Modular non relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 3/8"BSP
LR18-C4-F000	Modular self relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 1/2"BSP
LR18-C4-R000	Modular non relieving regulator with 0 - 8.5bar (0 - 125psig) spring, 1/2"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/4"BSP, self relieving regulator with 0 - 4.2bar (0 - 60psig) range spring and fitted with tamper resistant kit. Order as LR18-C2-D0C0

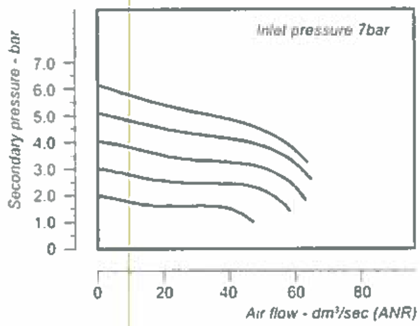
NOTE: Order pressure gauge separately - see page MA 2.1 and PG 1.1

4. Operating data

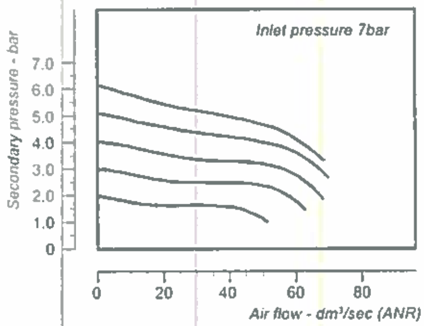
Maximum supply pressure	21bar (300 psig)	
Adjustment range pressure	0 - 1.7bar (0 - 25 psig) 0 - 4.2bar (0 - 60 psig) 0 - 8.5bar (0 - 125 psig) 0 - 17.1bar (0 - 250psig)	
Maximum operating temperature	79°C (175°F)	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LR18-C2-F000 LR18-C3-F000 LR18-C4-F000	49.0 dm³/sec (104scfm) 50.4 dm³/sec (107scfm) 60.0 dm³/sec (125scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Gauge ports	2 x 1/4"BSP	
Materials of construction	Body - Zinc Knob and panel nut - Acetal Bonnet - 33% glass filled nylon Valve assembly - Brass/nitrile Diaphragm assembly - Nitrile/zinc Springs - Steel (top), stainless steel (bottom) Seals - Nitrile	Body cap - ABS
Installation dimensions	See overleaf	
Mountings	See page MA 2.1	
Accessories	See page MA 2.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 2.1	
Mass	0.50kg (1.16lb)	
Service kits - Diaphragm assembly	RRP-96-656 (Self relieving) RRP-96-657 (Non relieving)	
- Valve assembly kit	RRP-96-658	
- Pressure springs (0 - 1.7bar)	RRP-96-659	
(0 - 4.2bar)	RRP-96-660	
(0 - 8.5bar)	RRP-96-661	
(0 - 17.1bar)	RRP-96-662	
- Plastic panel nut	RRP-96-675	

5. Flow characteristics

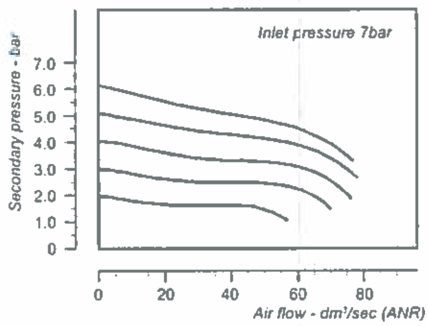
LR18-C2-F000



LR18-C3-F000

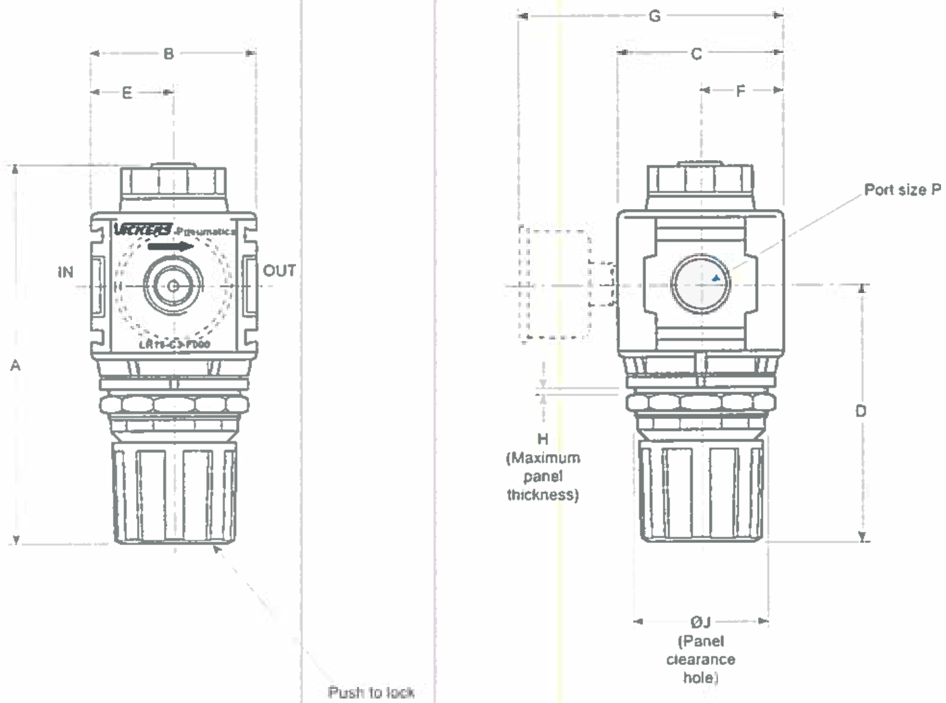


LR18-C4-F000



Characteristics and requirements for air line pressure regulators are in accordance with ISO 6953-1, *Pneumatic fluid power air line pressure regulators - Part 1.*

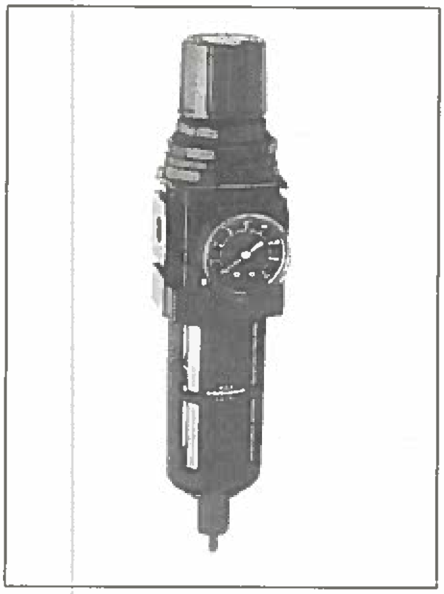
6. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	H	J	P
LR18-C2-F000	136	60	60	93	30	30	94	4	51	G1/4"
LR18-C3-F000	136	60	60	93	30	30	94	4	51	G3/8"
LR18-C4-F000	136	60	60	93	30	30	94	4	51	G1/2"

Note: - Panel mounting ring supplied as standard.

Filter / Regulators - LB18
1/4", 3/8", 1/2" BSP

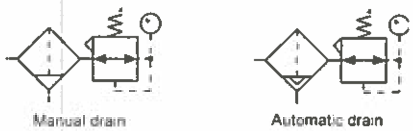


1. General description and application benefits

The integral Filter/Regulator air set combines all the advanced features and functions of the standard filter and regulator into a high performance unit. The LB18 models can be used where space and lower costs are required.

- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Available with or without pressure gauge - gauge supplied separately.
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbol



** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L B 1 8 - C * - * * * 0

[1] [2] [3] [4]

[1] Thread size
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] Diaphragm / Spring range
C = Self relieving / 0 - 1.7bar
D = Self relieving / 0 - 4.2bar
F = Self relieving / 0 - 8.5bar
G = Self relieving / 0 - 17.1bar
P = Non relieving / 0 - 1.7bar
Q = Non relieving / 0 - 4.2bar
R = Non relieving / 0 - 8.5bar
S = Non relieving / 0 - 17.1bar
(Code 'F' is standard)

[4] Options
0 = None
C = Tamper resistant regulator adjustment

[3] Bowl / Drain
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

Preferred model selection

LB18-C2-FK00	Modular self relieving filter/regulator with manual drain polycarbonate bowl, 1/4"BSP
LB18-C2-FG00	Modular self relieving filter/regulator with automatic drain polycarbonate bowl, 1/4"BSP
LB18-C3-FK00	Modular self relieving filter/regulator with manual drain polycarbonate bowl, 3/8"BSP
LB18-C3-FG00	Modular self relieving filter/regulator with automatic drain polycarbonate bowl, 3/8"BSP
LB18-C4-FK00	Modular self relieving filter/regulator with manual drain polycarbonate bowl, 1/2"BSP
LB18-C4-FG00	Modular self relieving filter/regulator with automatic drain polycarbonate bowl, 1/2"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/4"BSP, self relieving regulator with 0 - 4.2bar (0 - 60psig) range spring and fitted with metal bowl and automatic drain. Order as LB18-C2-DH00

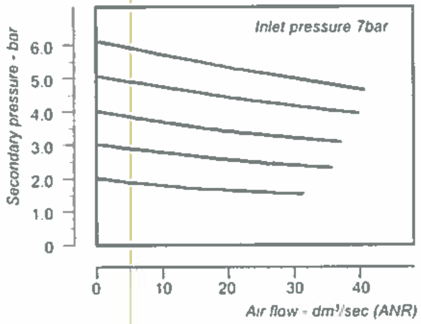
NOTE: Order pressure gauge separately - see page MA 2.1 and PG 1.1

4. Operating data

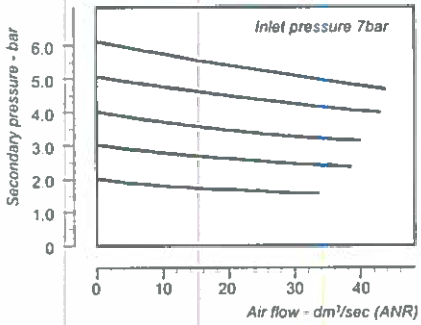
Maximum supply pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Adjustment range pressure	0 - 1.7bar (0 - 25 psig) 0 - 4.2bar (0 - 60 psig) 0 - 8.5bar (0 - 125 psig) 0 - 17.1bar (0 - 250psig)	
Maximum operating temperature	Polycarbonate bowl Metal bowl	52° C (125° F) 79° C (175° F)
Standard filtration	5 microns	
Retention capacity	50.9cm^3	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LB18-C2-FK00 LB18-C3-FK00 LB18-C4-FK00	47.1 dm^3/sec (100scfm) 49.5 dm^3/sec (105scfm) 58.9 dm^3/sec (125scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Gauge ports	2 x 1/4"BSP	
Materials of construction	See page F 2.1 for filter unit components See page R 2.1 for regulator unit components	
Installation dimensions	See overleaf	
Mountings	See page MA 2.1	
Accessories	See page MA 2.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 2.1	
Mass	0.67kg (1.48lb)	
Service kits	See page F 2.1 for filter unit components See page R 2.1 for regulator unit components	

5. Flow characteristics

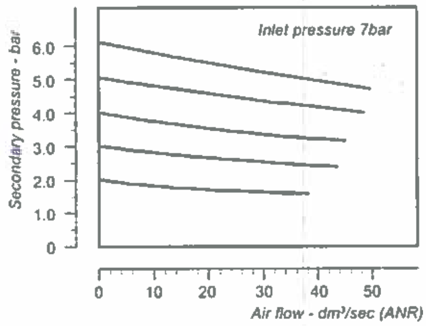
LB18-C2-FK00



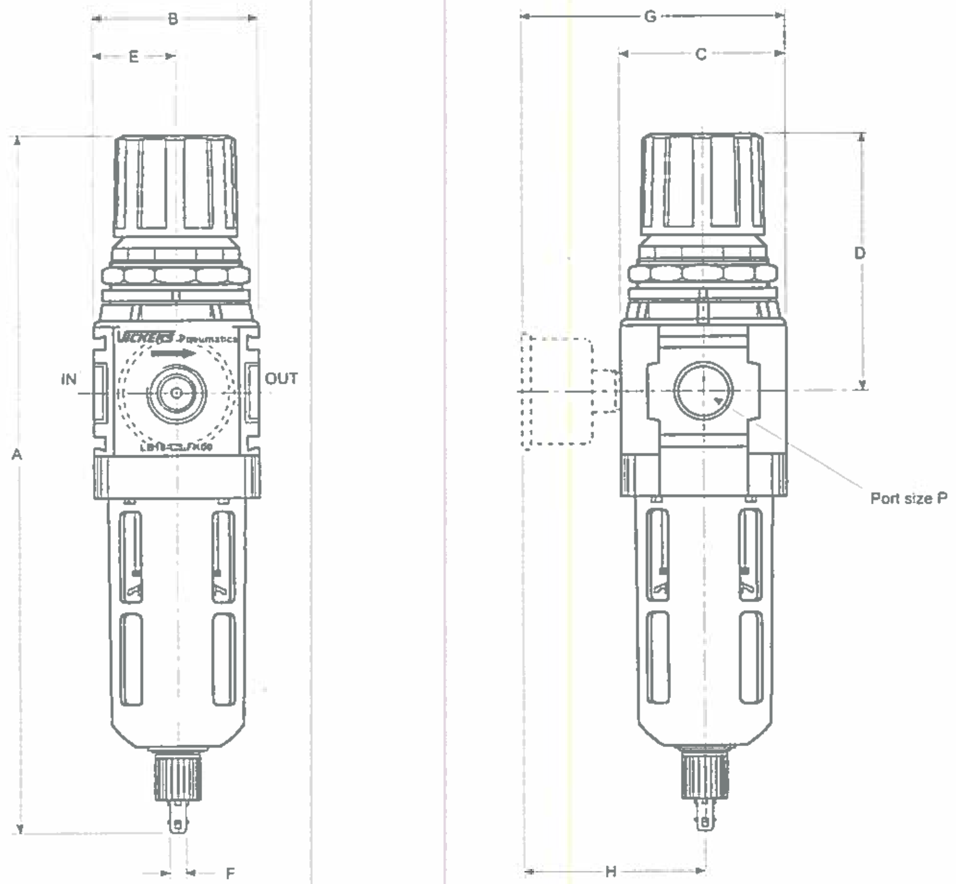
LB18-C3-FK00



LB18-C4-FK00



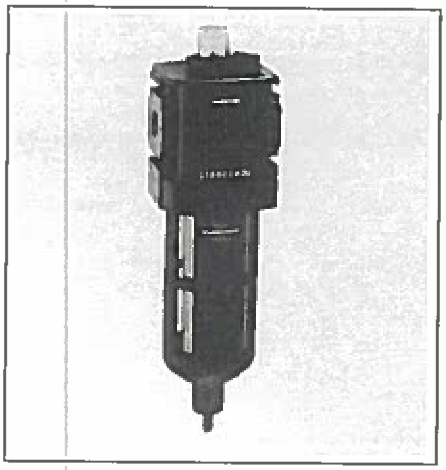
6. Installation dimensions in mm



Model code	A*	B	C†	D	E	F	G	H	P
LB18-C2-FK00	254	60	60	93	30	4.8mm I.D. tube barb fitting	95	65	G1/4"
LB18-C3-FK00	254	60	60	93	30	4.8mm I.D. tube barb fitting	95	65	G3/8"
LB18-C4-FK00	254	60	60	93	30	4.8mm I.D. tube barb fitting	95	65	G1/2"

* *For models with Auto Drain dimension A = 245mm.*
† *For models with Metal Bowls dimension C = 69mm*

Lubricators - LL18
1/4", 3/8", 1/2" BSP



1. General description and application benefits

The LL18 series lubricator injects an oil mist into the flowing air stream of a pneumatic circuit to automatically provide the proper internal lubrication for air operated tools and other air operated devices.
The precise amount of oil to be delivered to the air stream is determined by the integral adjusting knob needle valve which sets the exact oil drip rate and can be adjusted without tools.
The self adjusting vane automatically maintains a constant oil to air ratio by opening and closing in response to a wide range of changing air flows.
A feature of the LL18 series lubricator is that it can be refilled without shutting off the air pressure.**

- Self adjusting oil feed
- High flow, high efficiency.
- Integral quick disconnect clear polycarbonate bowl with guard.**
- Manual drain cock with barb tube fitting.
- Integral body thread or port adaptors.
- Full range of accessories.

2. Functional symbol

** Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

LL18 - C * - L * * 0
(1) under C *, (2) and (3) under the last two *

[1] **Thread size**
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] **Bowl / Drain**
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

[3] **Options**
0 = None
T = Tamper resistant adjustment

Preferred model selection

LL18-C2-LK00	Modular lubricator with polycarbonate bowl and manual drain, 1/4"BSP
LL18-C3-LK00	Modular lubricator with polycarbonate bowl and manual drain, 3/8"BSP
LL18-C4-LK00	Modular lubricator with polycarbonate bowl and manual drain, 1/2"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

Example - For 1/2"BSP, lubricator with metal bowl and manual drain and tamper resistant adjustment. Order as LL18-C4-LLT0

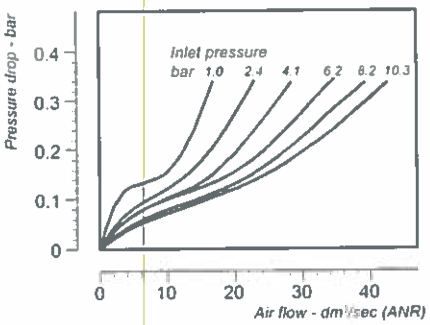
4. Operating data

Maximum operating pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Maximum operating temperature	Polycarbonate bowl Metal bowl	52°C (125°F) 79°C (175°F)
Reservoir capacity	121 cm³	
Recommended lubrication	ISO VG32	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LL18-C2-LK00 LL18-C3-LK00 LL18-C4-LK00	41.5 dm³/sec (88scfm) 42.4 dm³/sec (90scfm) 45.3 dm³/sec (96scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Materials of construction	Body - Zinc Body cap - ABS Bowl - Polycarbonate or Zinc Bowl guard - Polyamid Sight dome or sight gauge - Polyamid Seals - Nitrile (Polycarbonate bowl) Fluorocarbon (Metal bowl)	
Installation dimensions	See overleaf	
Mountings	See page MA 2.1	
Accessories	Tamper resistant cap Force fill adaptor and See page MA 2.1	LRP-96-680 LRP-96-704
Port adaptors (when required)	1/4", 3/8",1/2", 3/4" BSP - See page MA 2.1	
Mass	0.54kg (1.20lb)	
Service kits† - Bowl assembly - Manual drain - Bowl 'O' ring - Siphon tube assembly - Bypass assembly - 'O' ring, fill plug	LRP-96-701 GRP-96-685 GRP-96-640 LRP-96-677 LRP-96-678 LRP-96-679	

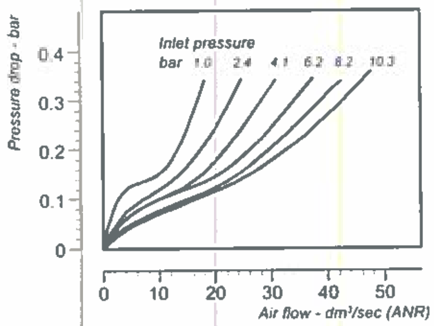
Notes: † Part numbers given are for standard units with polycarbonate bowls
- For service kits relating to other variants contact Customer Services Department

5. Flow characteristics

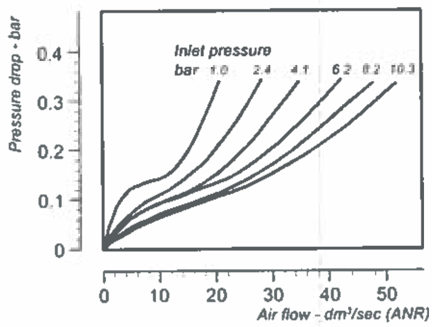
LL18-C2-LK00



LL18-C3-LK00

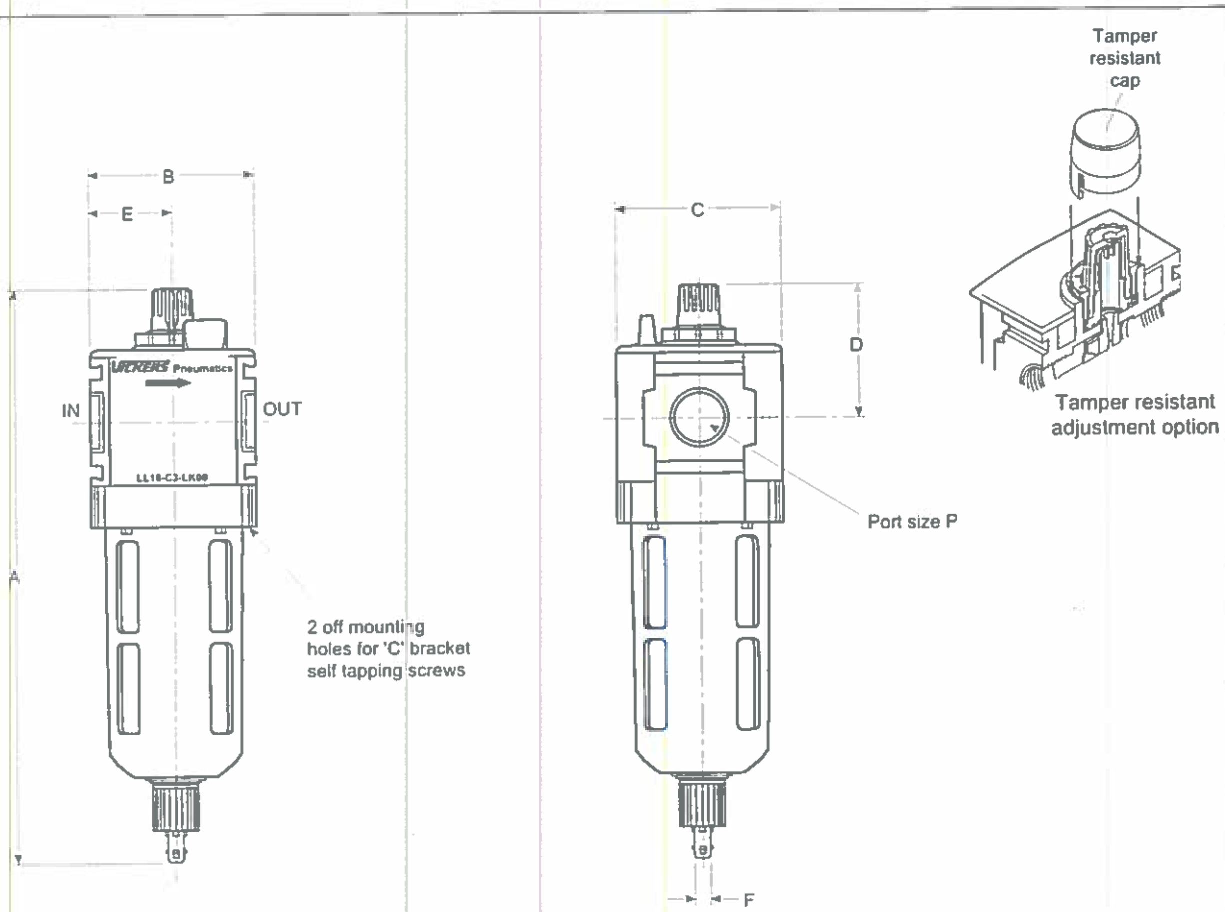


LL18-C4-LK00



Characteristics and requirements for compressed air lubricators are in accordance with ISO 6301-1, *Pneumatic fluid power - Compressed air lubricators - Part 1.*

6. Installation dimensions in mm



Model code	A	B	C*	D	E	F	P
LL18-C2-LK00	212	60	60	51	30	4.8mm I.D. tube barb fitting	G1/4"
LL18-C3-LK00	212	60	60	51	30	4.8mm I.D. tube barb fitting	G3/8"
LL18-C4-LK00	212	60	60	51	30	4.8mm I.D. tube barb fitting	G1/2"

* *For models with Metal Bowls dimension C = 69mm*

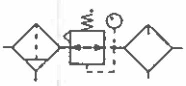
Filter/Regulator, Lubricator combinations - LD18
1/4", 3/8", 1/2" BSP

1. General description and application benefits

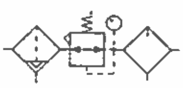
The LD18 modular combination models integrate all the unique features and advanced functions of the "18 Series" product line into a compact, lightweight and ready to mount assembly.
The units are pre-assembled utilizing modular joiner sets to facilitate easy installation and these can be fitted with 'T' brackets for wall mounting of the combination unit.

- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or modular end blocks.
- Full range of accessories.
- Self adjusting oil feed.
- Can be withdrawn from the front.

2. Functional symbol



Manual drain



Automatic drain

** **Conforms to EN 983 : 1994 *(Final draft)* Safety requirements for fluid power systems and their components - Pneumatic.**

3. Model code

L D 1 8 - C * - * * * *

[1] [2] [3] [4]

[1] **Thread size**
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] **Diaphragm / Spring range**
C = Self relieving / 0 - 1.7bar
D = Self relieving / 0 - 4.2bar
F = Self relieving / 0 - 8.5bar
G = Self relieving / 0 - 17.1bar
P = Non relieving / 0 - 1.7bar
Q = Non relieving / 0 - 4.2bar
R = Non relieving / 0 - 8.5bar
S = Non relieving / 0 - 17.1bar
(Code 'F' is standard)

[3] **Bowls / Drains**
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

[4] **Options**
0 = None
C = Tamper resistant regulator adjustment
G = Pressure gauge
T = Tamper resistant lubricator adjustment
(If one option only is required use first position followed by '0'. For more than one option enter in alphabetical order)

Preferred model selection

LD18-C2-FKG0	Modular filter/regulator, lubricator combination with manual drain, 1/4"BSP
LD18-C2-FGG0	Modular filter/regulator, lubricator combination with automatic drain, 1/4"BSP
LD18-C3-FKG0	Modular filter/regulator, lubricator combination with manual drain, 3/8"BSP
LD18-C3-FGG0	Modular filter/regulator, lubricator combination with automatic drain, 3/8"BSP
LD18-C4-FKG0	Modular filter/regulator, lubricator combination with manual drain, 1/2"BSP
LD18-C4-FGG0	Modular filter/regulator, lubricator combination with automatic drain, 1/2"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.
Example - For 3/8"BSP, self relieving filter/regulator with 0 - 4.2bar (0 - 60psig) range spring, polycarbonate bowls with automatic drain, without pressure gauge. Order as LD18-C3-DG00

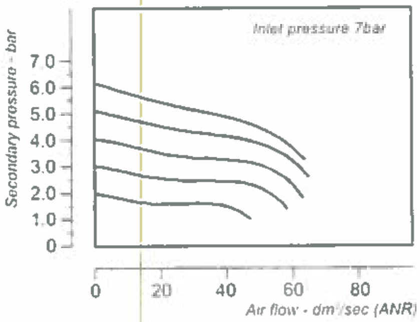
NOTE: Preferred model combinations supplied complete with centre back mounted pressure gauge.

4. Operating data

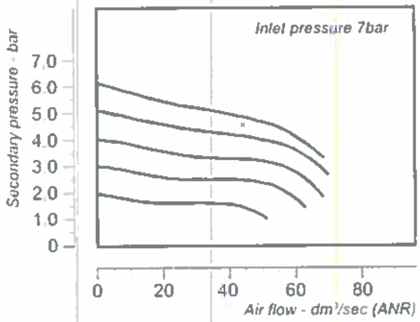
Maximum supply pressure	Polycarbonate bowl Metal bowl	10bar (150psig) 17bar (250psig)
Adjustment range pressure	See filter/regulator unit - page B 2.1	
Maximum operating temperature	Polycarbonate bowl Metal bowl	52° C (125° F) 79° C (175° F)
Standard filtration	5 microns	
Retention capacity (filter)	50.9cm³	
Reservoir capacity (lubricator)	121cm³	
Recommended lubrication	ISO VG32	
Maximum flow *(at 7 bar inlet pressure and 6 bar secondary pressure)*	LD18-C2-FK00 LD18-C3-FK00 LD18-C4-FK00	49.0 dm³/sec (104scfm) 50.4 dm³/sec (107scfm) 58.9 dm³/sec (125scfm)
Flow characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Gauge ports	2 x 1/4"BSP	
Materials of construction	See page F 2.1 for filter unit components See page R 2.1 for regulator unit components See page L 2.1 for lubricator unit component	
Installation dimensions	See overleaf	
Mountings	See page MA 2.1	
Accessories	See page MA 2.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 2.1	
Mass	1.30kg (2.98lb)	
Service kits	See individual units	

5. Flow characteristics

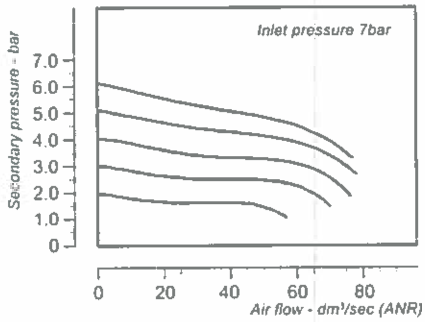
LD18-C2-FKG0



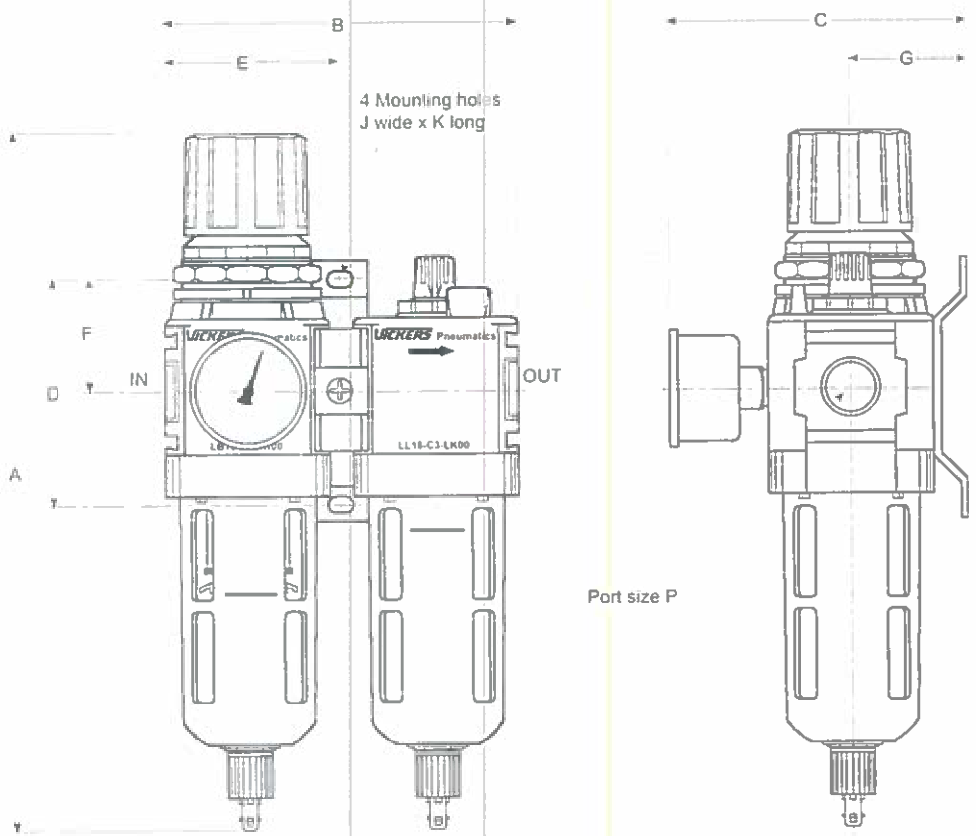
LD18-C3-FKG0



LD18-C4-FKG0



6. Installation dimensions in mm



Model code	A*	B	C	D	E	F	G	J	K	P
LD18-C2-FK00	254	128	106	83	64	41	41	7.1	14	G1/4"
LD18-C3-FK00	254	128	106	83	64	41	41	7.1	14	G3/8"
LD18-C4-FK00	254	128	106	83	64	41	41	7.1	14	G1/2"

* *For models with Auto Drain dimension A = 245mm.*

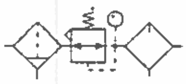
Filter, Regulator, Lubricator combinations - LC18
1/4", 3/8", 1/2" BSP

1. General description and application benefits

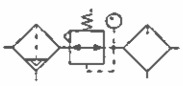
The LC18 modular combination models integrate all the unique features and advanced functions of the "18 Series" product line into a compact, lightweight and ready to mount assembly.
The units are pre-assembled utilizing modular joiner sets to facilitate easy installation and these can be fitted with 'T' brackets for wall mounting of the combination unit.

- Integral quick disconnect clear polycarbonate bowl with guard.**
- High flow, high efficiency.
- Self relieving ** (Non relieving option available).
- Manual drain cock with barb tube fitting - Automatic drain option.
- Integral body thread or modular end blocks.
- Full range of accessories.
- Lubricator can be filled under pressure.**
- Can be withdrawn from the front.

2. Functional symbol



Manual drain



Automatic drain

** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L C 1 8 - C * - * * * *

[1] [2] [3] [4]

[1] **Thread size**
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] **Diaphragm / Spring range**
C = Self relieving / 0 - 1.7bar
D = Self relieving / 0 - 4.2bar
F = Self relieving / 0 - 8.5bar
G = Self relieving / 0 - 17.1bar
P = Non relieving / 0 - 1.7bar
Q = Non relieving / 0 - 4.2bar
R = Non relieving / 0 - 8.5bar
S = Non relieving / 0 - 17.1bar
(Code 'F' is standard)

[3] **Bowls / Drains**
G = Polycarbonate with guard / Automatic drain
H = Metal with sight glass / Automatic drain
K = Polycarbonate with guard / Manual drain
L = Metal with sight glass / Manual drain

[4] **Options**
0 = None
C = Tamper resistant regulator adjustment
G = Pressure gauge
T = Tamper resistant lubricator adjustment
(If one option only is required use first position followed by '0'. For more than one option enter in alphabetical order)

Preferred model selection

LC18-C2-FKG0	Modular filter, regulator, lubricator combination with manual drain, 1/4"BSP
LC18-C2-FGG0	Modular filter, regulator, lubricator combination with automatic drain, 1/4"BSP
LC18-C3-FKG0	Modular filter, regulator, lubricator combination with manual drain, 3/8"BSP
LC18-C3-FGG0	Modular filter, regulator, lubricator combination with automatic drain, 3/8"BSP
LC18-C4-FKG0	Modular filter, regulator, lubricator combination with manual drain, 1/2"BSP
LC18-C4-FGG0	Modular filter, regulator, lubricator combination with automatic drain, 1/2"BSP

To order a required variant add the appropriate code letter/s in positions indicated above.

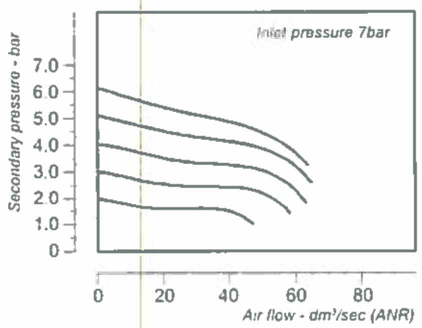
Example - For 1/4"BSP, 5 micron filter with polycarbonate bowl and manual drain, non relieving regulator with 0 - 8.5bar (0 - 125psig) range spring, without pressure gauge, lubricator with polycarbonate bowl and manual drain, tamper resistant kits fitted to regulator and lubricator. Order as LC18-C2-RKCT

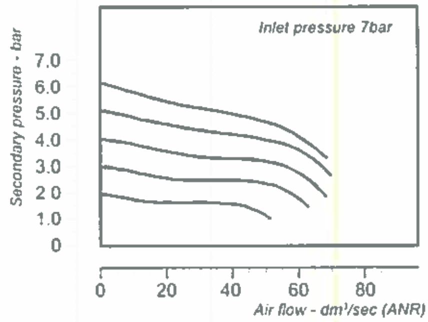
NOTE: Preferred model combinations supplied complete with centre back mounted pressure gauge.

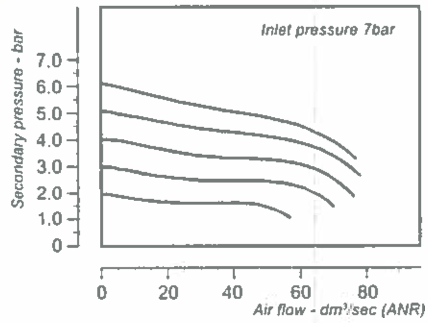
4. Operating data

Maximum supply pressure	Polycarbonate bowl 10bar (150psig) Metal bowl 17bar (250psig)
Adjustment range pressure	See regulator unit - page R 2.1
Maximum operating temperature	Polycarbonate bowl 52° C (125° F) Metal bowl 79° C (175° F)
Standard filtration	5 microns
Retention capacity (filter)	50.9cm³
Reservoir capacity (lubricator)	121cm³
Recommended lubrication	ISO VG32
Maximum flow (at 7 bar inlet pressure and 6 bar secondary pressure)	LC18-C2-FK00 49.0 dm³/sec (104scfm) LC18-C3-FK00 50.4 dm³/sec (107scfm) LC18-C4-FK00 58.9 dm³/sec (125scfm)
Flow characteristics	See overleaf
Type of connection	Screwthread
Thread size	1/4", 3/8", 1/2"BSP
Gauge ports	2 x 1/4"BSP
Materials of construction	See page F 2.1 for filter unit components See page R 2.1 for regulator unit components See page L 2.1 for lubricator unit components
Installation dimensions	See overleaf
Mountings	See page MA 2.1
Accessories	See page MA 2.1
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 2.1
Mass	1.83kg (4.04lb)
Service kits	See individual units

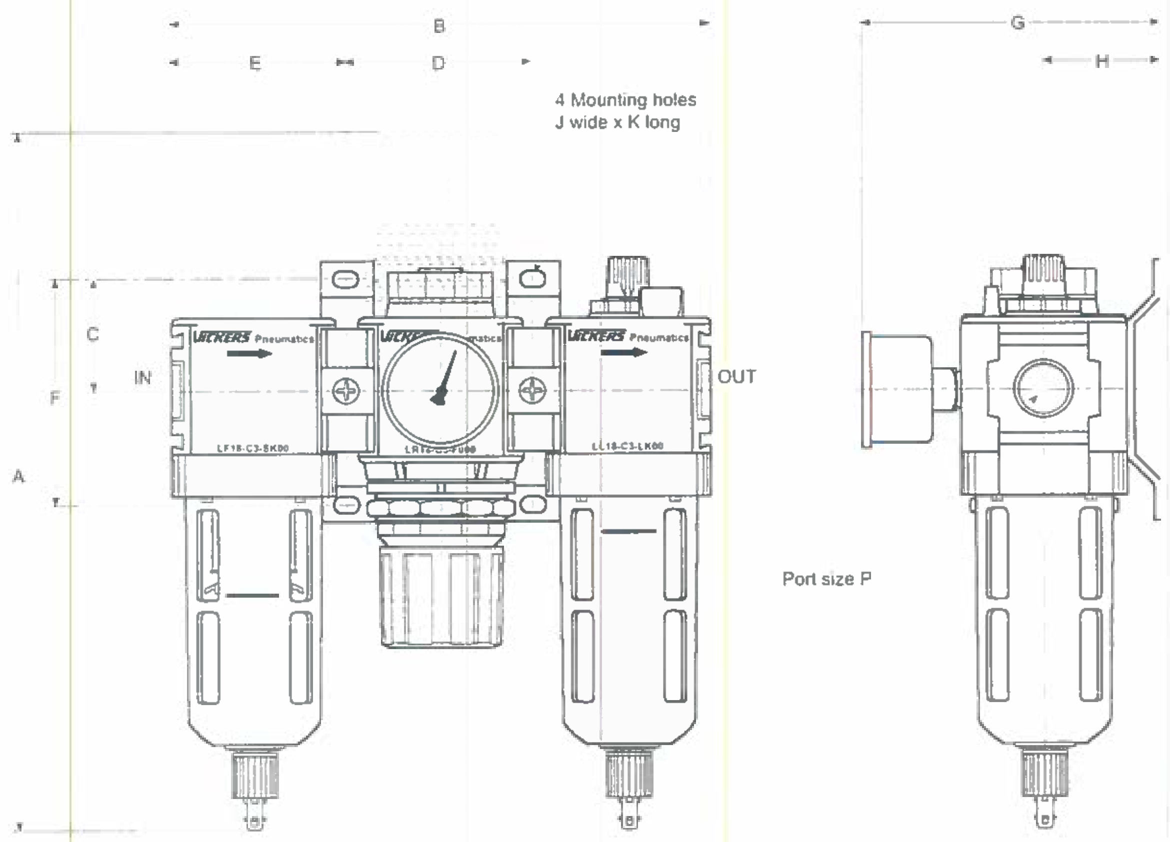
5. Flow characteristics







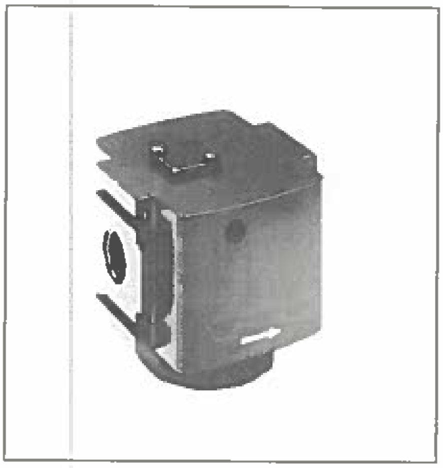
6. Installation dimensions in mm



Model code	A*	B	C	D	E	F	G	H	J	K	P
LC18-C2-FK00	254	197	41	69	64	83	106	41	7.1	14	G1/4"
LC18-C3-FK00	254	197	41	69	64	83	106	41	7.1	14	G3/8"
LC18-C4-FK00	254	197	41	69	64	83	106	41	7.1	14	G1/2"

* *With regulator in inverted position (solid lines) maximum overall height A = 212mm.*

Slow start valve - LS18
1/4", 3/8", 1/2" BSP

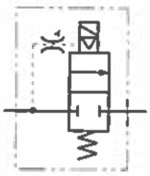


1. General description and application benefits

The slow start valve is used in compressed air systems to control the rate of downstream pressure build up at start-up.
The slow start valve is also referred to as the "Monday Morning" valve or smooth start valve.
The slow start valve allows cylinders, valves and other pneumatically operated components to gradually move into their normal start-up position.
The design and operation of the slow start valve can reduce the possibility of equipment damage and occupational hazard to operatives **.
The normally closed slow start valves are available either internal air piloted or solenoid operated.

- High flow, high efficiency.
- Prevents shocks to systems.
- Prevents injury to users.
- No external pilot supply required.
- Adjustable time between start and operating.

2. Functional symbol



** **Conforms to EN 983 : 1994 *(Final draft)***
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

L S 1 8 - C * - * 0 * *
[1] [2] [3] [4]

[1] **Thread size**
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] **Actuator**
A = Internal air pilot
E = Solenoid (NC)

[3] **Option**
0 = None

[4] **Electrical voltage**
00 = None
SA = No coil (stem assembly only)
JZ = 12v DC
KZ = 24v DC
MZ = 48v DC
KY = 24v 50/60Hz AC
MY = 48v 50/60Hz AC
RY = 110/120v 50/60Hz AC
SY = 220/240V 50/60Hz AC

Preferred model selection

LS18-C2-A000	Modular slow start valve, internal air pilot operated, 1/4"BSP
LS18-C2-E0††	Modular slow start valve, solenoid operated, 1/4"BSP
LS18-C3-A000	Modular slow start valve, internal air pilot operated, 3/8"BSP
LS18-C3-E0††	Modular slow start valve, solenoid operated, 3/8"BSP
LS18-C4-A000	Modular slow start valve, internal air pilot operated, 1/2"BSP
LS18-C4-E0††	Modular slow start valve, solenoid operated, 1/2"BSP

†† = Solenoid voltage code - to be specified (see position [4] above)

Example - For 3/8"BSP,24v DC solenoid operated slow start valve. Order as LS18-C3-E0KZ

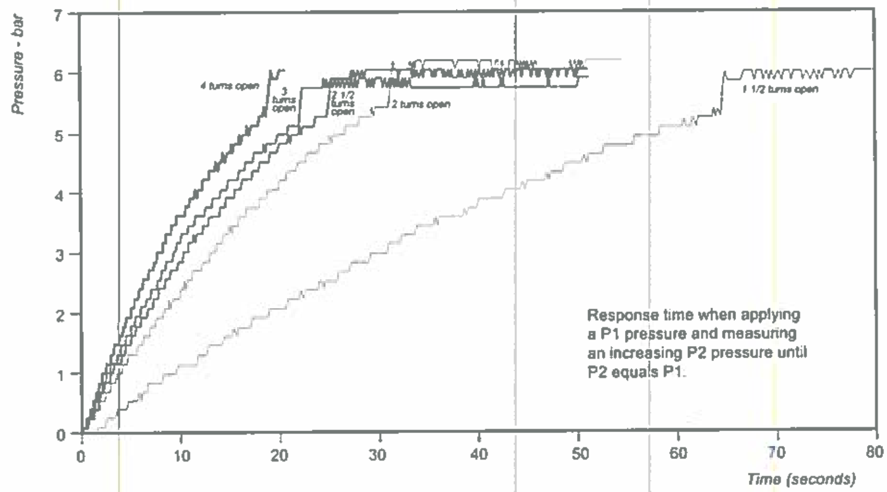
NOTE: ***Unit will be supplied as air operated version (LS18-C*-A000) plus solenoid sub assembly (VEM22D-MO††) for assembly by customer***

4. Operating data

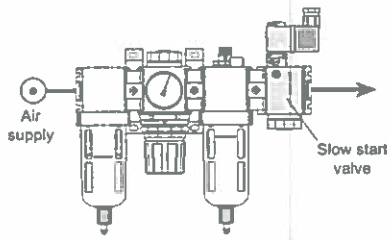
Maximum operating pressure	10bar (150psig)	
Maximum operating temperature	79°C (175°F)	
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LS18-C2-A000 LS18-C3-A000 LS18-C4-A000	44.8dm³/sec (95scfm) 47.6dm³/sec (101scfm) 53.3dm³/sec (113scfm)
Performance characteristics	See overleaf	
Type of connection	Screwthread	
Thread size	1/4", 3/8", 1/2"BSP	
Materials of construction	Body - Aluminium Bottom plug - 33% glass filled nylon Valve assembly - Brass/nitrile Springs - Stainless steel Seals - Nitrile	
Installation dimensions	See overleaf	
Mountings	See page MA 2.1	
Accessories	See page MA 2.1	
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 2.1	
Mass	0.42kg (0.93lb)	
Service kits	Solenoid stem assembly - VEM13-126 Solenoid coil - VEM13-141††	

†† = Solenoid voltage code - to be specified (see position [4] above)

5. Performance characteristics

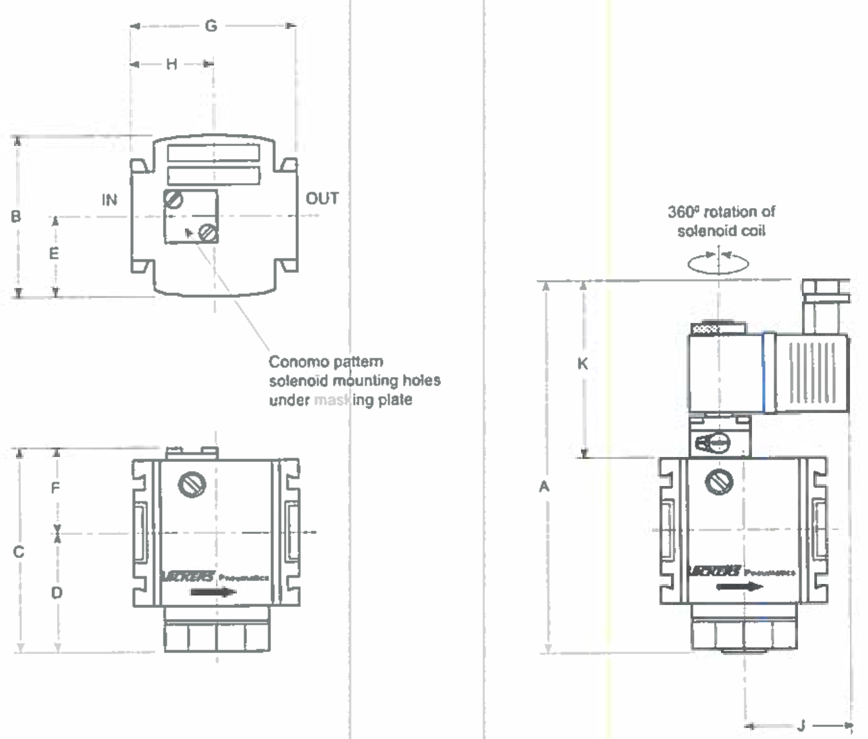


6. Typical installation



Slow start valve as part of air preparation assembly feeding an entire system

7. Installation dimensions in mm



Model code	Port size	A	B	C	D	E	F	G	H	J	K
LS18-C2-A000	G1/4"	-	60	75	43.5	30	31	60	30	-	-
LS18-C2-E0††	G1/4"	134	60	-	43.5	30	-	60	30	41	64
LS18-C3-A000	G3/8"	-	60	75	43.5	30	31	60	30	-	-
LS18-C3-E0††	G3/8"	134	60	-	43.5	30	-	60	30	41	64
LS18-C4-A000	G1/2"	-	60	75	43.5	30	31	60	30	-	-
LS18-C4-E0††	G1/2"	134	60	-	43.5	30	-	60	30	41	64

†† = Solenoid voltage code - to be specified (see position 4 on page SS 2.1)

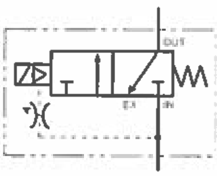
Emergency stop valve with slow start - LE18
1/4", 3/8", 1/2" BSP

1. General description and application benefits

A unique combination of electronic on/off valve and slow start valve in a single unit.
The unique advantage of the slow start portion of the valve is that it is truly volume-independent . It is adjustable and once set the unit will maintain the same start time regardless of changes in volume, up to and including an open line on the downstream side. The design and operation of the slow start valve can reduce the possibility of equipment damage and occupational hazard to operatives **.
The unit is normally closed and in emergency stop situation exhausts on the secondary side with the primary side completely shut off. Exhaust ports are located on the rear and downstream sides of the unit.

- High flow, high efficiency.
- Adjustable time between start and operating.
- True volume independence.
- Choice of 2 exhaust ports.

2. Functional symbol



** Conforms to EN 983 : 1994 *(Final draft)*
Safety requirements for fluid power systems and their components - Pneumatic.

3. Model code

LE18 - C * - * 0 * *

[1] [2] [3] [4]

[1] **Thread size**
2 = 1/4"
3 = 3/8"
4 = 1/2"

[2] **Actuator**
E = Solenoid (NC)

[3] **Option**
0 = None

[4] **Electrical voltage**
SA = No coil (stem assembly only)
JZ = 12v DC
KZ = 24v DC
MZ = 48v DC
KY = 24v 50/60Hz AC
MY = 48v 50/60Hz AC
RY = 110/120v 50/60Hz AC
SY = 220/240V 50/60Hz AC

Preferred model selection

LE18-C2-E0††	Modular emergency stop/slow start valve, solenoid operated, 1/4"BSP
LE18-C3-E0††	Modular emergency stop/slow start valve, solenoid operated, 3/8"BSP
LE18-C4-E0††	Modular emergency stop/slow start valve, solenoid operated, 1/2"BSP

†† = Solenoid voltage code - to be specified (see position [4] above)

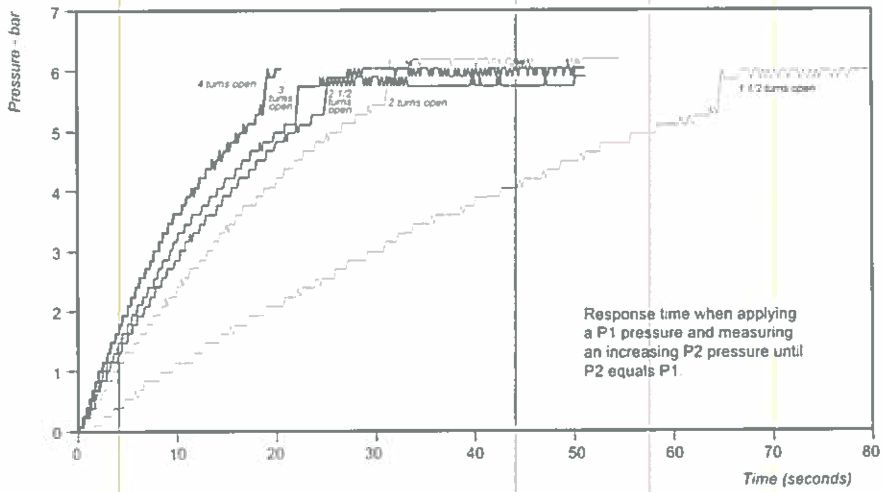
Example - For 3/8"BSP, 24v DC solenoid operated emergency stop/slow start valve. Order as LE18-C3-E0KZ

4. Operating data

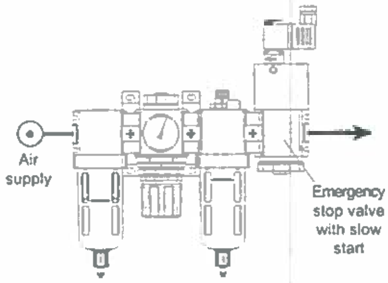
Maximum operating pressure	10bar (150psig)
Maximum operating temperature	79°C (175°F)
Maximum flow *(at 10 bar inlet pressure and 0.3 bar pressure drop)*	LE18-C2-E000 44.8dm³/sec (95scfm) LE18-C3-E000 47.6dm³/sec (101scfm) LE18-C4-E000 53.3dm³/sec (113scfm)
Slow start adjustment range	1.0 to 2.0 seconds
Exhaust time	1 second maximum to commence exhaust
Exhaust flow	Kv = 43 (Cv = 3.0) minimum
Type of connection	Screwthread
Thread size	1/4", 3/8", 1/2"BSP
Materials of construction	Body - Aluminium Bottom plug - 33% glass filled nylon Valve assembly - Brass/nitrile Springs - Stainless steel Seals - Nitrile
Installation dimensions	See overleaf
Mountings	See page MA 2.1
Accessories	See page MA 2.1
Port adaptors (when required)	1/4", 3/8", 1/2", 3/4"BSP - See page MA 2.1
Mass	1.01kg (2.23lb)
Service kits	Solenoid stem assembly - VEM13-126 Solenoid coil - VEM13-141††

†† = Solenoid voltage code - to be specified (see position [4] above)

5. Performance characteristics

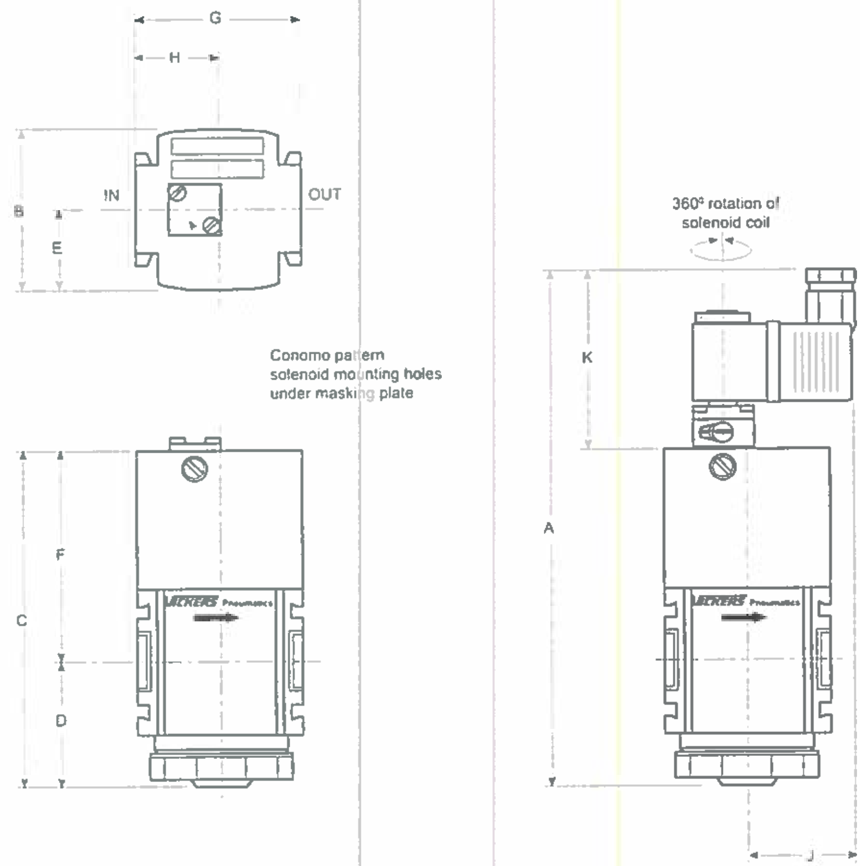


6. Typical installation



Emergency stop valve with slow start as part of air preparation assembly feeding an entire system

7. Installation dimensions in mm

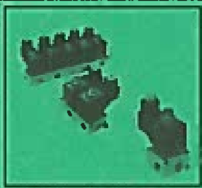
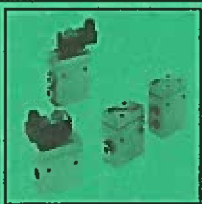
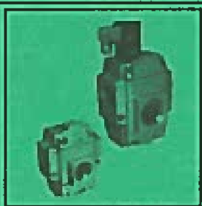
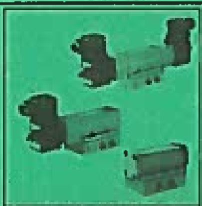
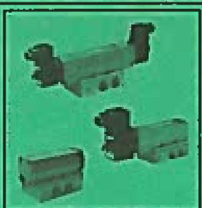
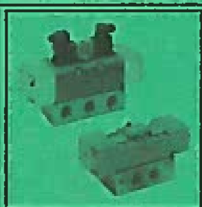


Model code	Port size	A	B	C	D	E	F	G	H	J	K
LE18-C2-A000	G1/4"	-	60	122	45.5	30	76.5	60	30	-	-
LE18-C2-E0 ⁱⁱ	G1/4"	186	60	-	45.5	30	-	60	30	41	64
LE18-C3-A000	G3/8"	-	60	122	45.5	30	76.5	60	30	-	-
LE18-C3-E0 ⁱⁱ	G3/8"	186	60	-	45.5	30	-	60	30	41	64
LE18-C4-A000	G1/2"	-	60	122	45.5	30	76.5	60	30	-	-
LE18-C4-E0 ⁱⁱ	G1/2"	186	60	-	45.5	30	-	60	30	41	64

ⁱⁱ = Solenoid voltage code - to be specified (see position 4 on page ES2.1)

HEAVY DUTY VALVES

Heavy duty poppet slide and spool valves

		Series	Function	Port size	Cv	Flow to atmosphere	Page numbers
Solenoid pilot / poppet valves		VE25C VE26C	3/2	G1/4"	0.15	5.0 dm^3/sec	VE 1.1 VE 1.2
Pilot slide valves		VA174 VA177 VA178 VA179	3/2 4/2	G1/8"	0.17	4.0 dm^3/sec	VA 1.1 VA 1.2
Poppet valves		PV117B PV517B PV119B PV519B	2/2 3/2	G1/4" G1/2"	1.19 2.17	35 dm^3/sec 64 dm^3/sec	PV 1.1 PV 1.2
CKD Heavy duty poppet valves		NAP11 NVP11	3/2 Universal N/C or N/O	Rc3/4" Rc1" Rc1$^1/_4$" Rc1$^1/_2$" Rc2"	8.4 8.6 25.8 27.0 28.2		PV 3.1 PV 3.2
Linear slide valves		VL25	4/2 4/3	G1/4"	0.72	22 dm^3/sec	VL 1.1 VL 1.2
Linear slide valves		VL50	4/2 4/3	G1/2"	2.15	61 dm^3/sec	VL 2.1 VL 2.2
CKD Selex spool valves		4F6 4F7	5/2 5/3	G1/2" G3/4" G1"	4.89 4.35 8.7	380 dm^3/sec	4F 1.1 4F 1.2

VE26C is manifold mounted form of VE25C for 2 to 12 stations

VICKERS

Pneumatics

APPROVED TO BS EN ISO 9001 QUALITY STANDARD CERTIFICATE No. Q10706

HEAVY DUTY VALVES

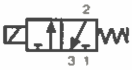
SECTION 4

The Power in Automation

Heavy duty solenoid pilot / poppet valves
Series VE25C and VE26C

1/4"BSP
3/2

VE25C



Description
3-way normally closed solenoid operated valve type VE25C.

Operating medium
Suitable for use with compressed air, hydraulic oil, non-corrosive liquids and inert gases.

Temperature range
Fluid temperature -10°C to +60°C.
Maximum ambient temperature 60°C.

Type of connection
Screwthread on all ports.

Port sizes
1/4"BSP female ports 1 and 2.
1/8" or 1/4"BSP female port 3 when fitted with adaptors (see note below).

Operating pressure range
0 to 7 bar.

Standard valve orifice
2.5mm diameter bottom.
2.0mm diameter top.

Flow rate (at 6.3 bar body pressure)
5.0 dm³/sec (11 scfm).

Flow factors
Kv = 2.14, Cv = 0.15.

.Special remarks
Valve can be supplied as free standing unit VE25C or manifold mounted VE26C (manifold mounted units are detailed on page VE 1.2).

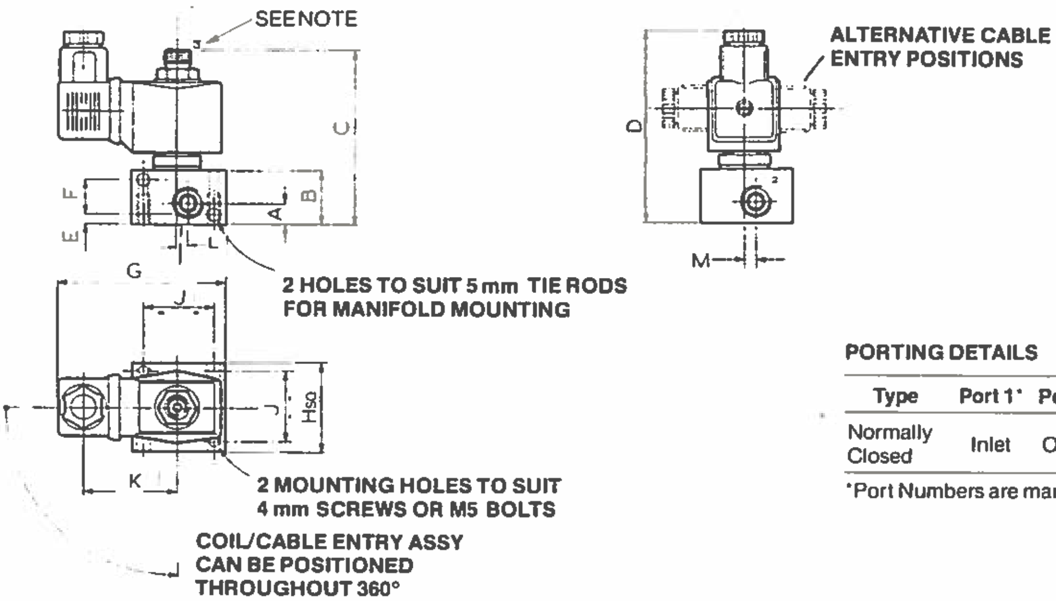
The unit is also used as an operator on solenoid operated linear slide valves and poppet valves described in this catalogue. Each unit is supplied with electrical connector.

The port block is made of brass with solenoid core assembly in stainless steel.

An alternative supply port is provided, for use as required. This is located on the opposite face to the standard supply port and is normally plugged.

Solenoid voltage codes
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC
KZ = 24v DC
Other voltages available to order.
Add code for required voltage to end of model number - i.e. VE25CRY.

Principal dimensions and porting details



PORTING DETAILS

Type	Port 1*	Port 2*	Port 3
Normally Closed	Inlet	Outlet	Exhaust

*Port Numbers are marked on body.

A	B	C	D	E	F	G	H	J	K	L	M
9	25	80	90	5	16	74	40	32	41	3	4

NOTES - (1) Solenoid stem thread is M12 x 1.0 male
Piping adaptors - For G1/8" order part number SF1924, for G1/4" order part number SF1925.
(2) Specify solenoid voltage as shown above.

VE26C

VE25C solenoid valves can be supplied in manifold mounted form in arrangements from 2 to 12 valves.

When ordering, specify VE26C part number to indicate manifold mounting, and suffix with number of valves required:-

e.g. VE26C/8 indicates manifold unit of 8 valves.

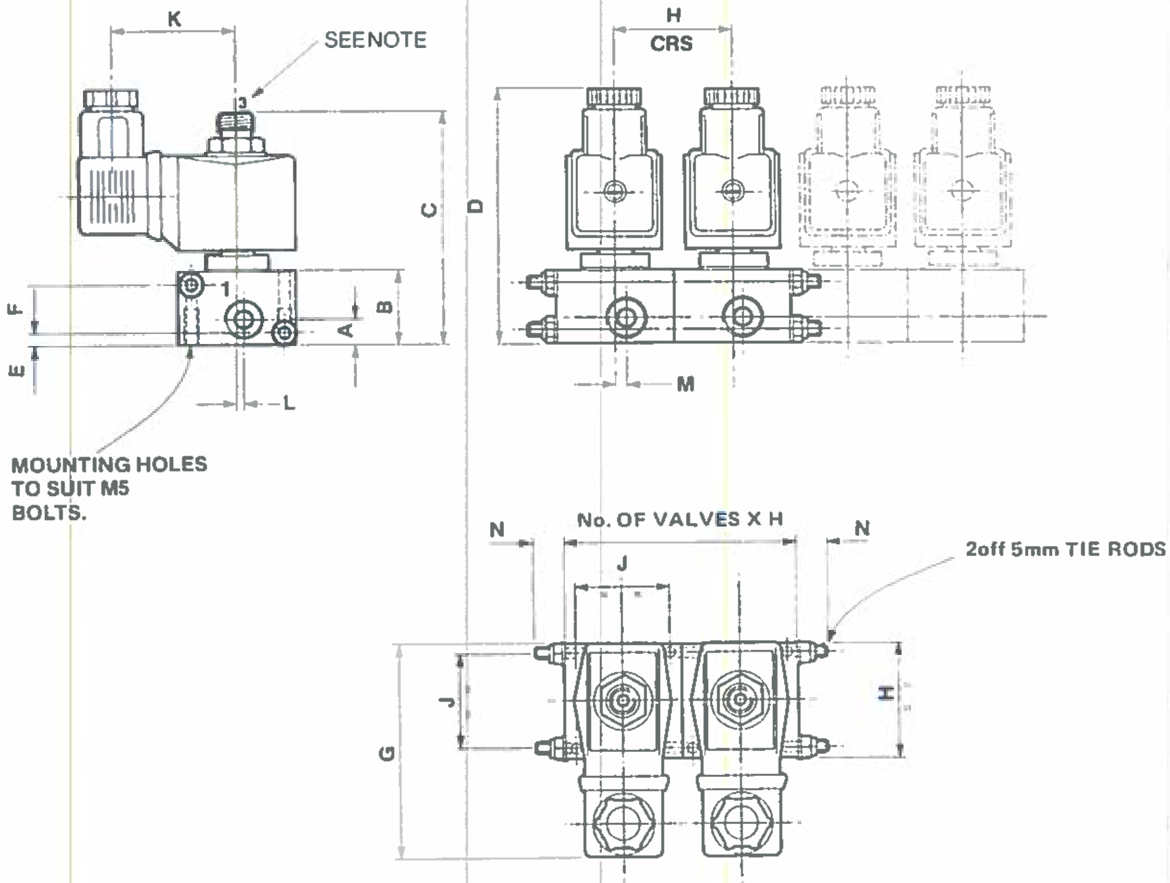
For arrangements exceeding 12 valves contact our Technical Sales Office.

For detailed valve specification see page VE 1.1 (Solenoid pilot valve type VE25C).

NOTE:
If manifold mounted valves are to be confined within a small space or fitted in a control box, a heat accumulation can develop when several valves are energized simultaneously. In these cases good ventilation, whether it be with ventilation holes or artificial ventilation by means of a fan, should be provided. Valves which are energized at the same time should not be mounted adjacent to each other wherever possible.

Mounting kits
Manifold mounted valves are supplied as number of VE25C valves plus mounting kits comprising tie rods, nuts washers and 'O' rings.
For 2 to 6 valves - Kit number KV70A
For 7 to 12 valves - Kit number KV71A

Principal dimensions



A	B	C	D	E	F	G	H	J	K	L	M	N
9	25	80	90	5	16	74	40	32	41	3	4	10

Manifold units may be secured from underside by utilising 5mm tapped mounting holes adjacent to port 2.

NOTES - (1) Solenoid stem thread is M12 x 1.0 male
Piping adaptors - For G1/8" order part number SF1924, for G1/4" order part number SF1925.
(2) Specify solenoid voltage as shown on page VE 1.1.

Heavy duty pilot slide valves
Series VA170

1/8"BSP
3/2 and 4/2

Description
Pilot valve suitable for 3 or 4 way, spring return operation.

Type of connection
Screwthread.

Port sizes
All ports 1/8"BSP.

Operating pressure
0 to 10 bar.

Temperature range
-20°C to +80°C.

Nominal flow to atmosphere (at 6.3bar body pressure)
4 dm³/sec (8.5 scfm).

Type of lubricant
ISO VG37 mineral oil

Flow factors
Kv = 2.4, Cv = 0.17.

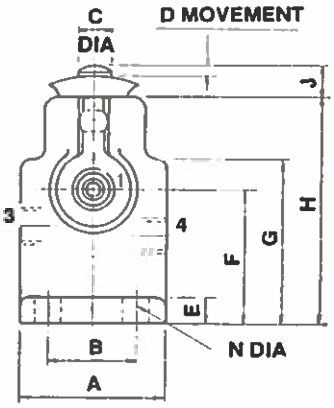
Materials of construction
Brass body and port block. Stainless steel spindle. Operating spindle on plunger and lever operated models protected by a gaiter.

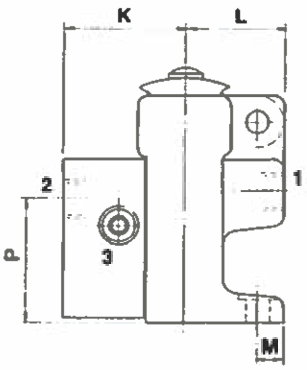
Special remarks
Valves are supplied ready for 3 way normally closed function with plugged exhaust. Blanking plug may be removed to obtain 4 way function.
See table below for full porting details.

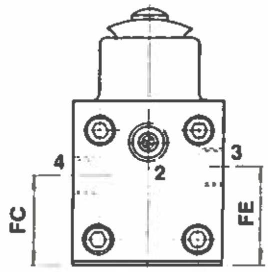
Operating effort

Supply pressure	Operating effort	
	Plunger operated	Lever operated
bar	N	N
1.0	30.9	23.2
1.6	38.7	29.4
2.5	46.4	35.3
4.0	61.9	47.1
6.3	82.5	62.8
10.0	118.7	90.2

Principal dimensions and porting details





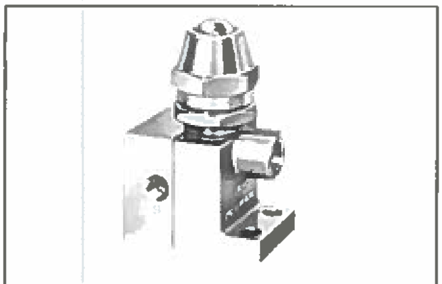


A	B	C	D	E	F	G	H
38.1	22.2	9.5	3.2	7.9	34.1	42.0	58.7

J	K	L	M	N	P	FC	FE
7.1	30.9	25.4	6.3	6.3	31.7	23.0	25.4

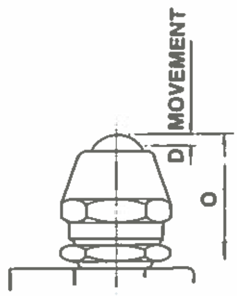
PORTING

Type	Port 1	Port 2	Port 3	Port 4
3-way N/C	Inlet	Outlet	Exhaust	Plugged
3-way N/O	Inlet	Plugged	Exhaust	Outlet
4-way	Inlet	Outlet	Exhaust	Outlet



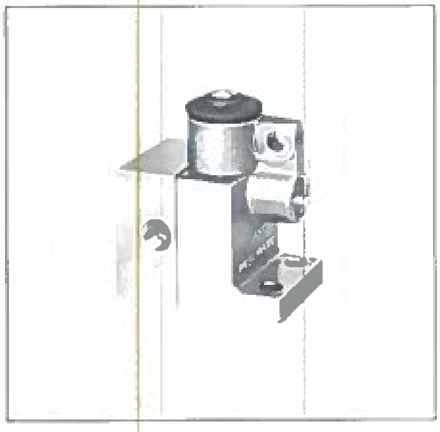
VA174
Ball operated

Suitable for 3-way or 4-way operation.

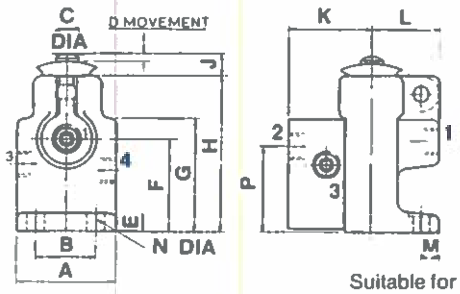


D	O*
3.1	84.9

*Dimension to base



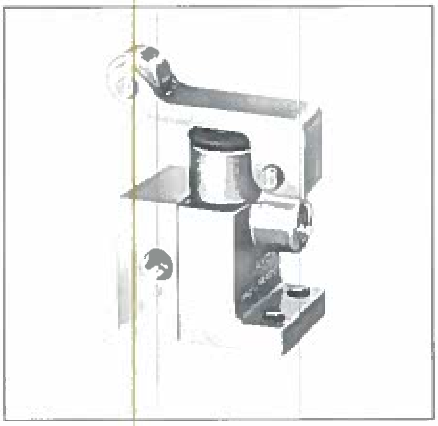
VA177
Plunger operated



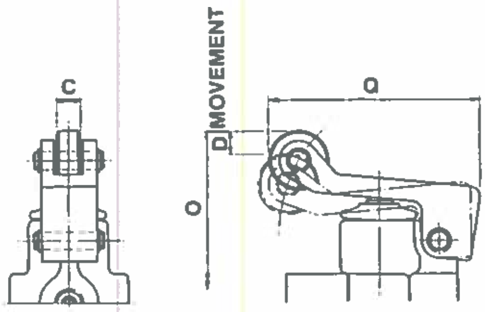
Suitable for direct mechanical operation.
Suitable for 3-way or 4-way operation.

A	B	C	D	E	F	G	H	J
38.1	22.2	9.5	3.2	7.9	34.1	42.0	58.7	7.1

K	L	M	N	P
30.9	25.4	6.3	6.3	31.7

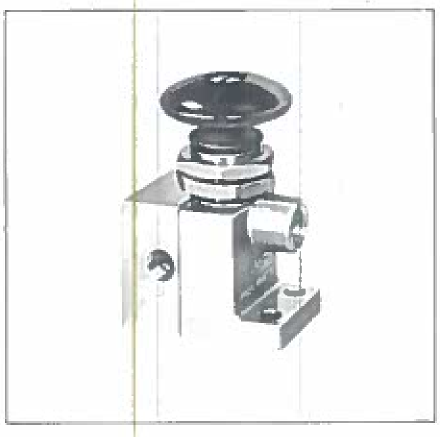


VA178
Roller operated

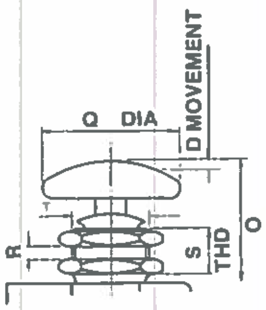


For cam operation.
Suitable for 3-way or 4-way operation.

C	D	O*	Q
9.5	7.9	87.3	66.6



VA179
Hand pad operated



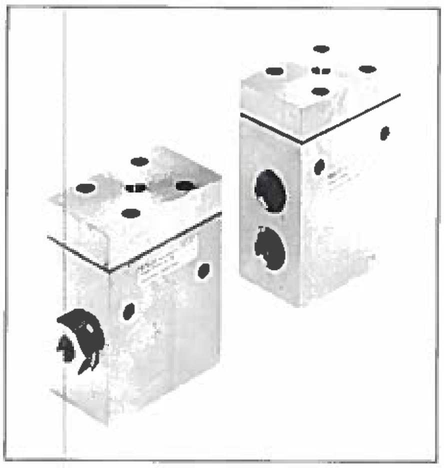
Available with Black, Red or Green pads. (Black supplied as standard). Provided with two locknuts to facilitate Panel Mounting.
Suitable for 3-way or 4-way operation.

D	O*	Q	R	S	T
3.2	80.9	44.4	4.7	14.2	25 mm Clearance Hole

*Dimension to base

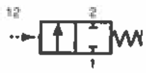
Heavy duty poppet valves Series PV

1/4" and 1/2"BSP 2/2 and 3/2

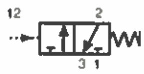


Air pilot operated

2 way
PV117B/15
PV517B/15



3 way
PV119B/15
PV519B/15



Description
Heavy duty poppet valves, available for 2 or 3 way function. Air and solenoid versions with spring return are available.
3 way types are suitable for normally open or normally closed function.
The design of this series is based on one body size , with adapators fitted to convert ports from 1/2" to 1/4" where applicable.

Type of connection
Screwthread.

Port sizes
1/4" or 1/2"BSP main ports.
1/8"BSP pilot ports - all types.
Solenoid versions have independent pilot connections which may be piped normally open or normally closed.

Operating pressure
Air operated - 0.8 to 10 bar.
Solenoid pilot operated - 0.8 to 7 bar.

Minimum pilot air pressure
(at 6.3 bar body pressure)
All types N/C - 2.2 bar.
All types N/O - equal to body pressure.

Flow to atmosphere
(at 6.3 bar body pressure)
PV117B, PV119B - 35 dm³/sec (74 scfm).
PV517B, PV519B - 64 dm³/sec (136 scfm).

Operating temperature range
Air operated -20°C to +75°C.
Solenoid operated -10°C to +60°C.

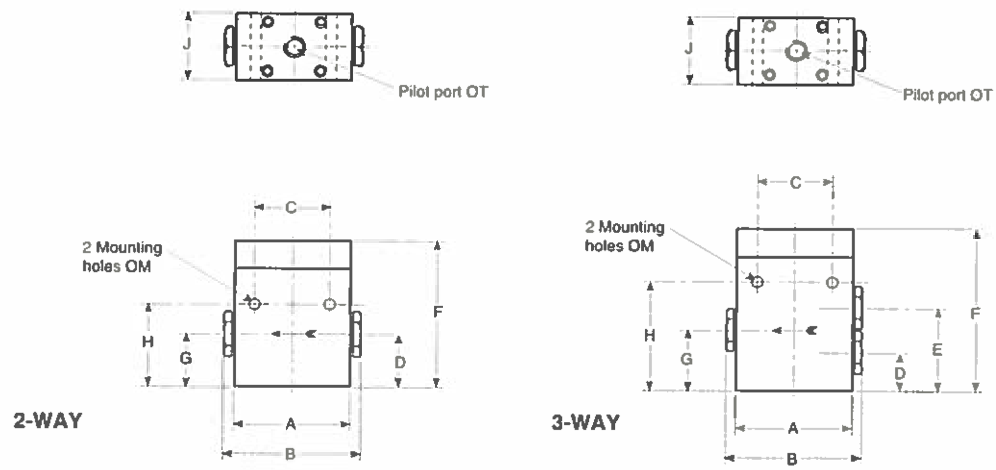
Type of lubricant
ISO VG 37 mineral oil

Materials of construction
Brass body with brass pilot port block, base cover, piston and poppets.
Stainless steel spindle and spring.
Nitrile seals.

Flow factors
Kv = 17.0 and 31.0, Cv = 1.19 and 2.17.

Solenoid versions
See under individual types.
Solenoid voltage codes:-
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC
KZ = 24v DC
Other voltages available to order.
Add code for required voltage to end of model number - i.e. PV117B/68KZ.

Principal dimensions

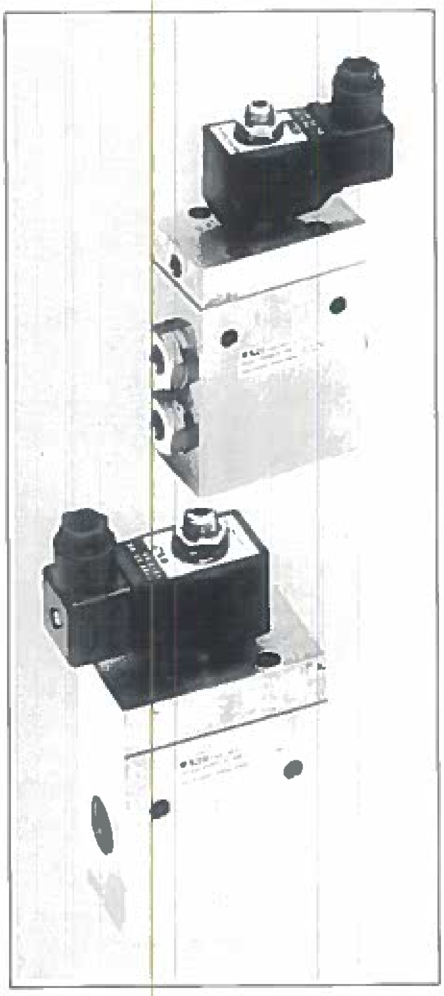


2-WAY

Type No.	Port size	A	B	C	D	F	G	H	J	M	T
PV117B/15	G1/4"	76.2	89.2	50	34.5	97	34.5	54	44.4	7.1	1/8"BSP
PV517B/15	G1/2"	76.2	-	50	34.5	97	34.5	54	44.4	7.1	1/8"BSP

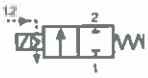
3-WAY

Type No.	Port size	A	B	C	D	E	F	G	H	J	M	T
PV119B/15	G1/4"	76.2	89.2	50	25	55	108	40	73	44.4	7.1	1/8"BSP
PV519B/15	G1/2"	76.2	-	50	25	55	108	40	73	44.4	7.1	1/8"BSP

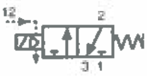


Solenoid pilot operated

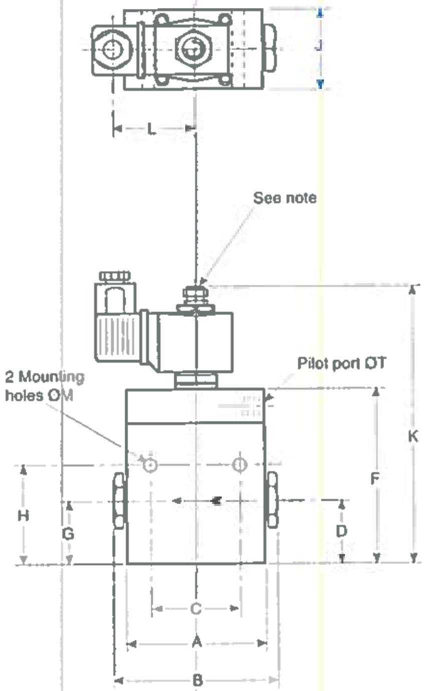
2 way
PV117B/68
PV517B/68



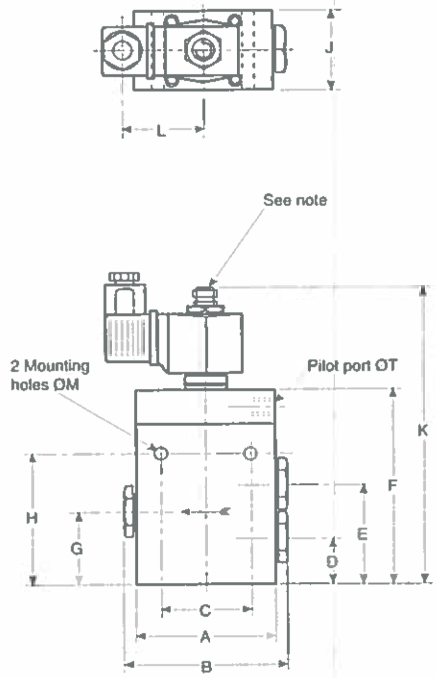
3 way
PV119B/68
PV519B/68



Principal dimensions



2-WAY



3-WAY

2-WAY

Type No.	Port size	A	B	C	D	F	G	H	J	K	L	M	T
PV117B/68	G1/4"	76.2	89.2	50	34.5	97	34.5	54	44.4	151.5	44	7.1	1/8"BSP
PV517B/68	G1/2"	76.2	-	50	34.5	97	34.5	54	44.4	151.5	44	7.1	1/8"BSP

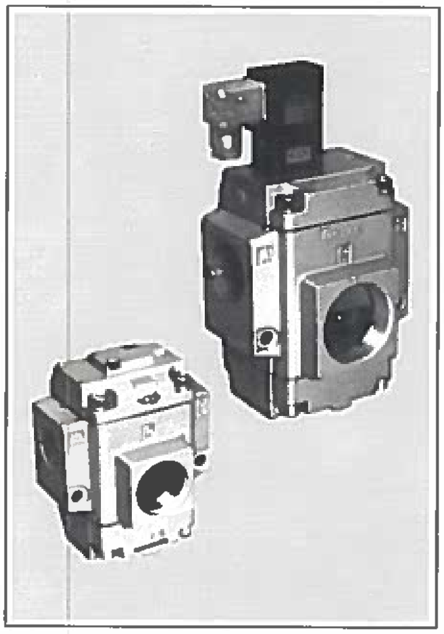
3-WAY

Type No.	Port size	A	B	C	D	E	F	G	H	J	K	L	M	T
PV119B/68	G1/4"	76.2	89.2	50	25	55	108	40	73	44.4	162.5	44	7.1	1/8"BSP
PV519B/68	G1/2"	76.2	-	50	25	55	108	40	73	44.4	162.5	44	7.1	1/8"BSP

NOTES - (1) Solenoid stem thread is M12 x 1.0 male
Piping adaptors - For G1/8" order part number SF1924, for G1/4" order part number SF1925.
(2) Specify solenoid voltage as shown on page PV 1.1.

CKD Heavy duty poppet valves
Series NAP, NVP

3/4", 1", 1¼, 1½, 2"BSPT - 3/2 Universal - N/C or N/O
100, 125, 160, 200, 250, 320mm



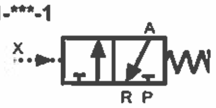
1. General description and application benefits

A range of 3 port, 2 position universal poppet valves for low vacuum and heavy duty compressed air applications. Spring return and available in air or solenoid operated versions.

- Balanced poppet design.
- High speed.
- High flow.
- Lube free.
- External pilot.
- Response time of 60ms or less.
- DIN plug as standard.

2. Functional symbols

NAP11-*-1**



NVP11-*-12G****

3. Model code

N	*	P	1	1	-	*	*	A	-	1	*	*		*	*

[1] [2] [3] [4]

[1] **Version**
A = Air operated
V = Solenoid operated

[2] **Port sizes**
20 = Rc3/4"
25 = Rc1"
32 = Rc1¼"
40 = Rc1½"
50 = Rc2"

[3] **Operator**
No code = Air operated
2G = Solenoid with DIN plug

[4] **Voltage code**
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC
KZ = 24v DC

Preferred model selection

Air operated valves

NAP11-20A-1	Rc3/4", 3 port, 2 position, air operated, spring return.
NAP11-25A-1	Rc1", 3 port, 2 position, air operated, spring return.
NAP11-32A-1	Rc1¼", 3 port, 2 position, air operated, spring return.
NAP11-40A-1	Rc1½", 3 port, 2 position, air operated, spring return.
NAP11-50A-1	Rc2", 3 port, 2 position, air operated, spring return.

Solenoid operated valves

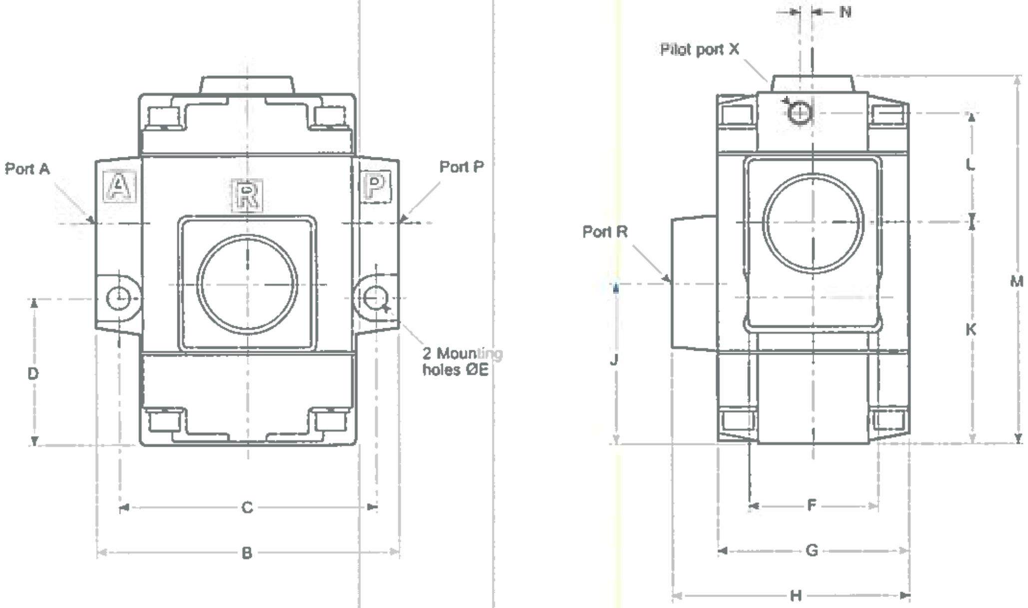
NVP11-20A-12G**	Rc3/4", 3 port, 2 position, solenoid operated, spring return.
NVP11-25A-12G**	Rc1", 3 port, 2 position, solenoid operated, spring return.
NVP11-32A-12G**	Rc1¼", 3 port, 2 position, solenoid operated, spring return.
NVP11-40A-12G**	Rc1½", 3 port, 2 position, solenoid operated, spring return.
NVP11-50A-12G**	Rc2", 3 port, 2 position, solenoid operated, spring return.

*** = Solenoid voltage code - to be specified (see position [4] above)*

4. Operating data

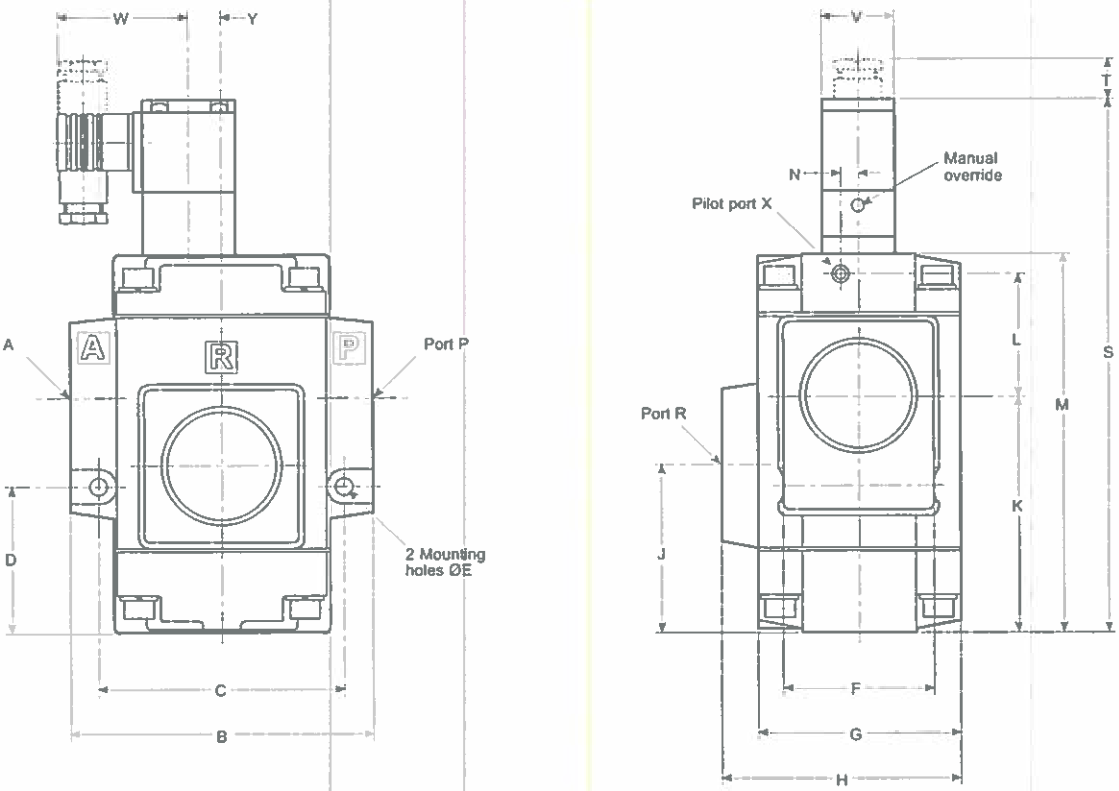
Flow factors	3/4" - Cv = 8.4 (Kv = 120), 1" - Cv = 8.6 (Kv = 123), 1¼" - Cv = 25.8 (Kv = 369), 1½" - Cv = 27.0 (Kv =386), 2" - Cv = 28.2 (Kv = 403)
Proof pressure	12.0 bar
Working pressure	0 - 8.0 bar (1 Torr - 7 bar for vacuum use)
Pilot air pressure	3.5 - 7.0bar
Ambient operating temperature range	-5°C to 60°C (3/4" to 1"), -5°C to 40°C (1¼" to 2")
Response times at 5.0bar	60msec or less
Valve seat leakage	1cm³/min or less at supply pressure of 0.2 - 8.0bar
Type of connection	Main ports - Rc3/4", Rc1", Rc1¼", Rc1½", Rc2" Pilot ports - Rc1/8"
Materials of construction	Body - Aluminium alloy Seals - Nitrile
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil.
Installation dimensions	See page PV 3.2
Mass	Valves: 3/4" - 1.4kg 1" - 1.4kg 1¼" - 4.2kg 1½" - 4.2kg 2" - 4.1kg Extra for solenoid: 3/4",1" - 0.10kg 1¼", 1½", 2" - 0.30kg
Solenoid coils	Class B moulded coil. Nominal voltages - See position [4] of model code above Power consumption - 3/4" to 1" - 2.0/1.7W (50/60Hz AC), 4W (DC) 1¼" to 2" - 7.5/6.0W (50/60Hz AC), 8W (DC) Starting power - 3/4" to 1" - 9.2/7.2VA (50/60Hz AC) 1¼" to 2" - 40/35VA (50/60Hz AC)
Service kits	Details on request

5. Installation dimensions in mm - Air operated valves



Model number	Port P	Port A	Port R	B	C	D	E	F	G	H	J	K	L	M	N	Port X
NAP11-20A-1	Rc3/4"	Rc3/4"	Rc1"	100	85	49	7	42	63	78	54	74	36.5	123	0	Rc1/8"
NAP11-25A-1	Rc1"	Rc1"	Rc1"	100	85	49	7	42	63	78	54	74	36.5	123	0	Rc1/8"
NAP11-32A-1	Rc1¼"	Rc1¼"	Rc2"	140	118	71	9.5	71	95	112.5	79	113	53	190.5	5	Rc1/8"
NAP11-40A-1	Rc1½"	Rc1½"	Rc2"	140	118	71	9.5	71	95	112.5	79	113	53	190.5	5	Rc1/8"
NAP11-50A-1	Rc2"	Rc2"	Rc2"	140	118	71	9.5	71	95	112.5	79	113	53	190.5	5	Rc1/8"

6. Installation dimensions in mm - Solenoid operated valves



Model number	Port P	Port A	Port R	B	C	D	E	F	G	H	J	K	L	M	N	S	T	V	W	Port X	Y
NVP11-20A-12G**	Rc3/4"	Rc3/4"	Rc1"	100	85	49	7	42	63	78	54	74	36.5	118	0	170.5	14.5	25	53	Rc1/8"	0
NVP11-25A-12G**	Rc1"	Rc1"	Rc1"	100	85	49	7	42	63	78	54	74	36.5	118	0	170.5	14.5	25	53	Rc1/8"	0
NVP11-32A-12G**	Rc1¼"	Rc1¼"	Rc2"	140	118	71	9.5	71	95	112.5	79	113	53	182	5	256.5	21.5	34	62	Rc1/8"	16
NVP11-40A-12G**	Rc1½"	Rc1½"	Rc2"	140	118	71	9.5	71	95	112.5	79	113	53	182	5	256.5	21.5	34	62	Rc1/8"	16
NVP11-50A-12G**	Rc2"	Rc2"	Rc2"	140	118	71	9.5	71	95	112.5	79	113	53	182	5	256.5	21.5	34	62	Rc1/8"	16

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel:- +44 (0) 1952 586000 Fax:- +44 (0) 1952 586798

Printed in Great Britain

GB-P5044-0396

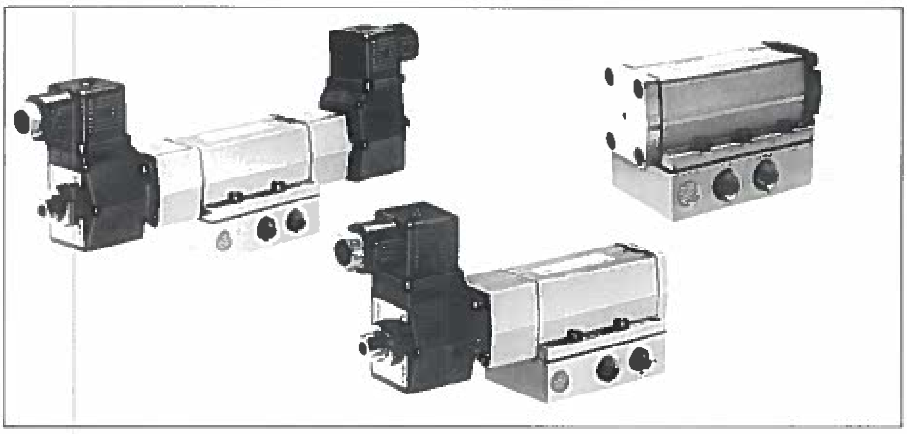
VICKERS

Pneumatics

Heavy duty linear slide valves Series VL25

1/4"BSP- 4/2 and 4/3

50, 63, 80, 100mm



Operating temperature range
Air operated -20ºC to +75ºC.
Solenoid operated -10ºC to +60ºC.

Type of lubricant
ISO VG 37 mineral oil.

Materials of construction
Brass body and port block. GRP end covers. Acetal copolymer moulded spool. Nitrile seals.

Special remarks
Ports 2, 3 and 4 are sealed during valve transition.

Flow factors
Kv = 10.25, Cv = 0.72.

Description
4 way heavy duty linear slide valve, port block mounted. Available in air or solenoid operated versions.

Type of connection
Screwthread.

Port sizes
1/4"BSP main ports.
1/8"BSP pilot ports.

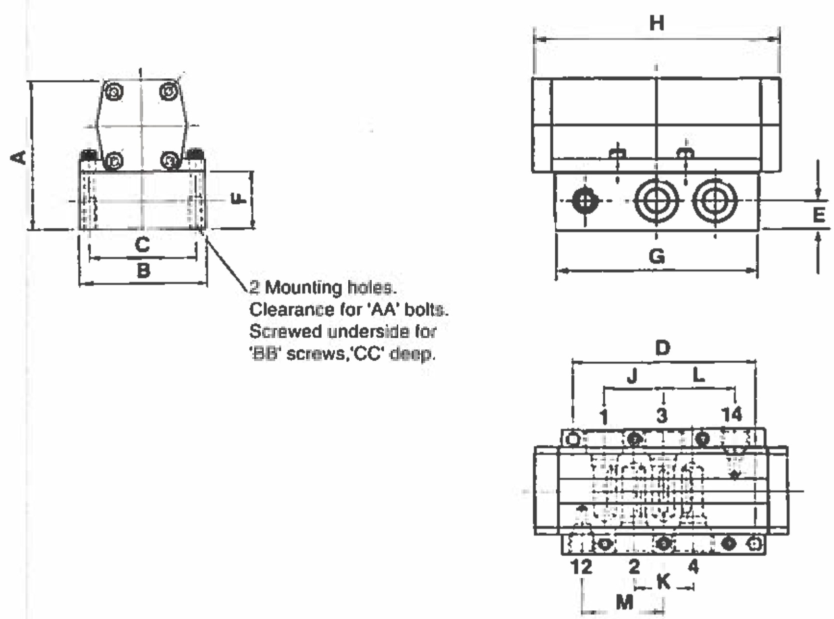
Operating pressure range
Air operated - 1 to 10 bar.
Solenoid operated - 1 to 7 bar.

Minimum pilot air pressure (at 6.3 bar body pressure)
VL25/15, 61 & 68 - 4.0 bar.
VL25/16, 62, 63, 67 & 69 - 2.6 bar.
VL25/16P, 60P & 66P - 3.6 bar.

Flow to atmosphere (at 6.3 bar body pressure)
22 dm³/sec (47 scfm).

Solenoid versions
See under individual types.
Solenoid voltage codes:-
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC
KZ = 24v DC
Other voltages available to order.
Add code for required voltage to end of model number - i.e. VL25/61RY.

Principal dimensions and porting details



2 Mounting holes. Clearance for 'AA' bolts. Screwed underside for 'BB' screws, 'CC' deep.

PORTING DETAILS

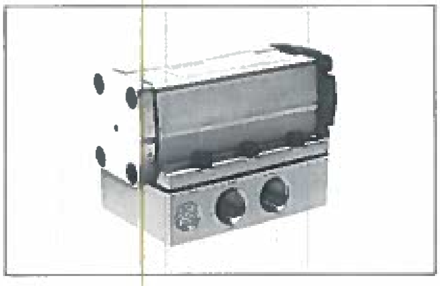
Port	BSP	Function
1	1/4"	Inlet
2	1/4"	Outlet
3	1/4"	Exhaust
4	1/4"	Outlet
12	1/8"	Pilot
14	1/8"	Pilot

(Port 12 - Pilot port for pilot air return valves).

RETURN SPRING FITTED ADJACENT TO PORT 12

A	B	C*	D*	E	F	G	H	J	K	L	M	AA	BB	CC
53	45	38.1	58.7	10	19	68	85	19	19	27	27	M4	M5	12

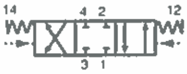
* Mounting hole centres



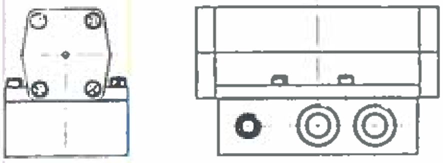
VL25/15
Air operated, 2 position.
Spring return.

VL25/16
Double air operated,
2 position.

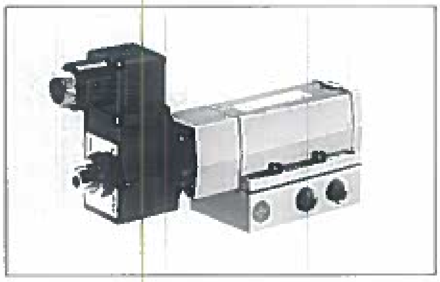
VL25/16P
Double air operated,
3 position. Spring centred.
Pressure held neutral.



Air operated valves



For principal dimensions see page VL 1.1



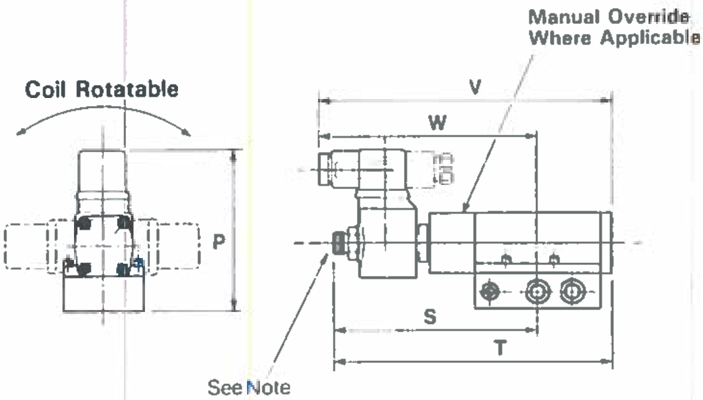
VL25/68
Single solenoid, 2 position.
Spring return.

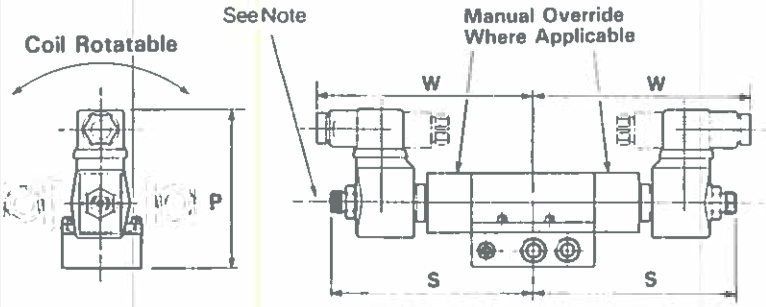
VL25/69
Single solenoid, 2 position.
Air return.

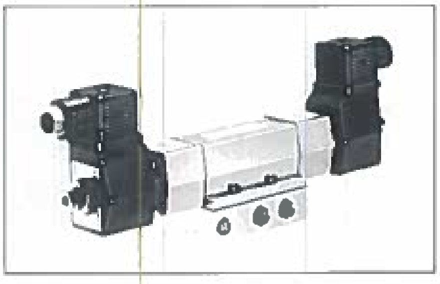
VL25/61
Single solenoid, 2 position
with manual override.
Spring return.

VL25/62
Single solenoid, 2 position
with manual override.
Air return.

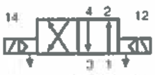
Solenoid operated valves





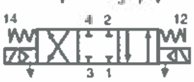


VL25/67
Double solenoid,
2 position.

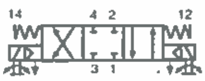


VL25/63
Double solenoid, with manual
override. 2 position

VL25/66P
Double solenoid, 3 position.
Spring centred.
Pressure held neutral.



VL25/60P
Double solenoid, 3 position.
Spring centred.
Pressure held neutral.
With manual override.



P	S	T	V	W
90	105	146	154	113

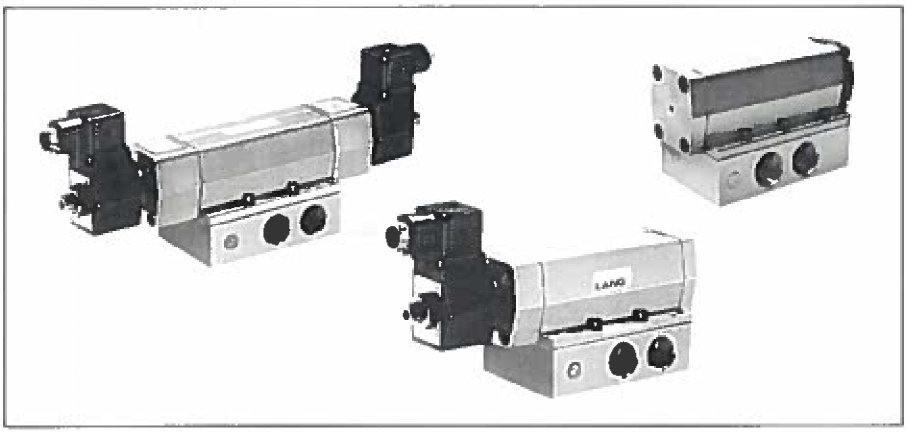
Special remarks
Solenoid operated versions have internal air supply to solenoid pilot(s) as standard. Standard valves can also be converted to provide separate supply to pilot solenoid(s) via adjacent pilot port(s).

NOTES - (1) Solenoid stem thread is M12 x 1.0 male
Piping adaptors - For G1/8" order part number SF1924,
for G1/4" order part number SF1925.
(2) Specify solenoid voltage as shown on page VL 1.1.

Heavy duty linear slide valves Series VL50

1/2"BSP- 4/2 and 4/3

80, 100, 125, 160mm



Description
4 way heavy duty linear slide valve, port block mounted. Available in air or solenoid operated versions.

Type of connection
Screwthread.

Port sizes
1/2"BSP main ports.
1/8"BSP pilot ports.

Operating pressure range
Air operated - 1 to 10 bar.
Solenoid operated - 1 to 7 bar.

Minimum pilot air pressure (at 6.3 bar body pressure)
VL50/15, 61 & 68 - 4.1 bar.
VL50/16, 62, 63, 67 & 69 - 1.9 bar.
VL50/16P, 60P & 66P - 2.9 bar.

Flow to atmosphere (at 6.3 bar body pressure)
61 dm³/sec (129 scfm).

Operating temperature range
Air operated -20°C to +75°C.
Solenoid operated -10°C to +60°C.

Type of lubricant
ISO VG 37 mineral oil.

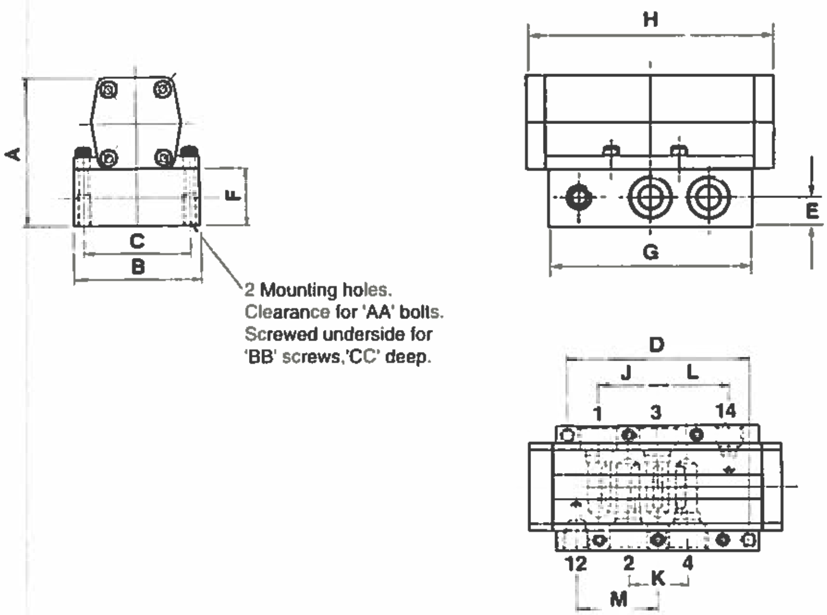
Materials of construction
Brass body and port block. GRP end covers. Acetal copolymer moulded spool.

Special remarks
Ports 2, 3 and 4 are sealed during valve transition.

Flow factors
Kv = 30.75, Cv = 2.15.

Solenoid versions
See under individual types.
Solenoid voltage codes:-
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC
KZ = 24v DC
Other voltages available to order.
Add code for required voltage to end of model number - i.e. VL50/66PSY.

Principal dimensions and porting details



PORTING DETAILS

Port	BSP	Function
1	1/2"	Inlet
2	1/2"	Outlet
3	1/2"	Exhaust
4	1/2"	Outlet
12	1/8"	Pilot
14	1/8"	Pilot

(Port 12 - Pilot port for pilot air return valves).

RETURN SPRING FITTED ADJACENT TO PORT 12

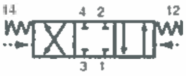
A	B	C*	D*	E	F	G	H	J	K	L	M	AA	BB	CC
76	62	52.4	88.9	15	29	100	123	29	29	35	40	M5	M6	16

* Mounting hole centres

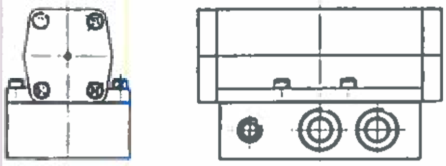
VL50/15
Air operated, 2 position.
Spring return.

VL50/16
Double air operated,
2 position.

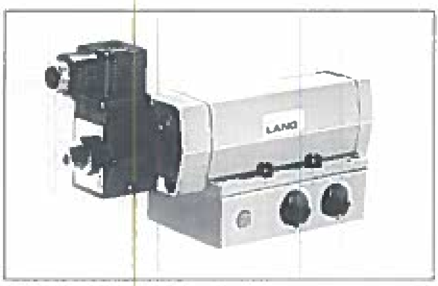
VL50/16P
Double air operated,
3 position. Spring centred.
Pressure held neutral.



Air operated valves



For principal dimensions see page VL 2.1

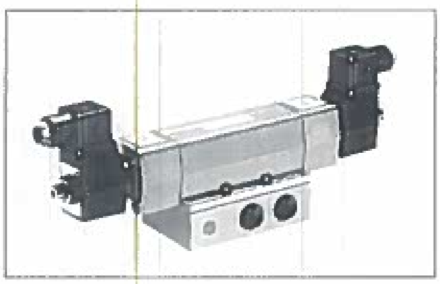


VL50/68
Single solenoid, 2 position.
Spring return.

VL50/69
Single solenoid, 2 position.
Air return.

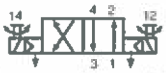
VL50/61
Single solenoid, 2 position
with manual override.
Spring return.

VL50/62
Single solenoid, 2 position
with manual override.
Air return.



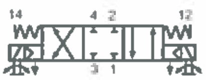
VL50/67
Double solenoid,
2 position.

VL50/63
Double solenoid, with manual
override. 2 position.

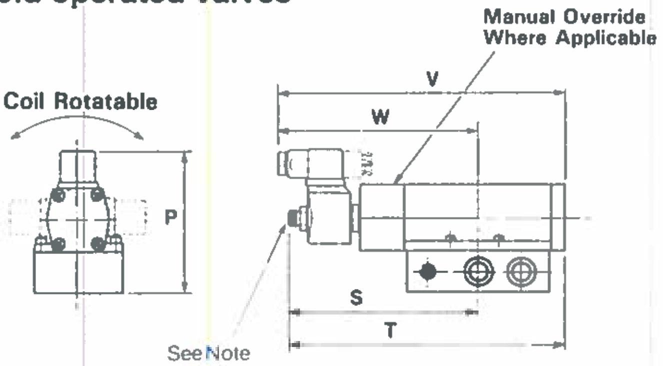


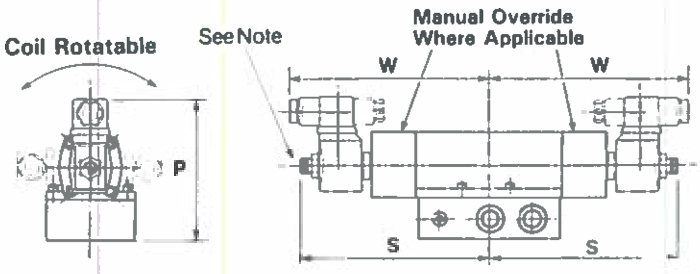
VL50/66P
Double solenoid, 3 position.
Spring centred.
Pressure held neutral.

VL50/60P
Double solenoid, 3 position.
Spring centred.
Pressure held neutral.
With manual override.



Solenoid operated valves





P	S	T	V	W
107	122	184	192	130

Special remarks
Solenoid operated versions have internal air supply to solenoid pilot(s) as standard. Standard valves can also be converted to provide separate supply to pilot solenoid(s) via adjacent pilot port(s).

NOTES - (1) Solenoid stem thread is M12 x 1.0 male
Piping adaptors - For G1/8" order part number SF1924,
for G1/4" order part number SF1925.
(2) Specify solenoid voltage as shown on page VL 2.1.

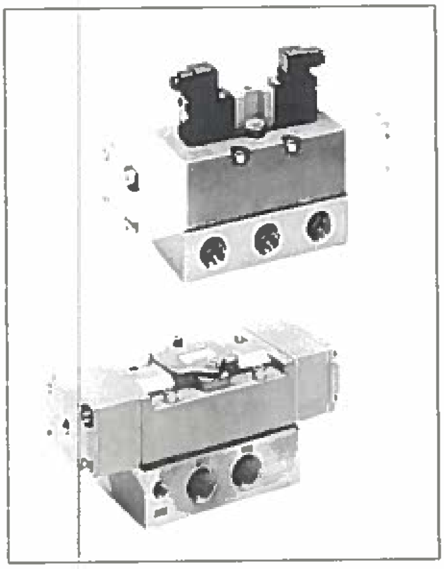
VICKERS

Pneumatics

CKD Selex spool valves Series 4F6 and 4F7

1/2", 3/4"and 1"BSP- 5/2 and 5/3

125, 160, 200, 250, 320mm



1. General description and application benefits

A range of high performance, pilot air or solenoid operated soft spool valves. Available in 5 port, 2 position or 5 port, 3 position versions.

- High flow.
- Piston speeds up to 420mm/sec.
- Lube free.
- Sub base monted.
- Manual override as standard.
- DIN plug as standard.
- Burn out resistance coil.
- Multi manifold versions available.
- Soft spool good for high and low operating frequency.

2. Functional symbols

See details on page 4F 1.2

Other models available

- Manifold versions.
- Smaller sizes.
- Body ported versions.

For further details see CKD catalogue ref CC-01A

3. Model code

4 F * * * - * * * - * *

[1] [2] [3] [4] [5]

[1] Series
6 = 4F6 series
7 = 4F7 series

[2] Position
1 = 2 position single acting
2 = 2 position double acting
3 = 3 position double acting pressure held neutral
4 = 3 position double acting pressure release neutral
5 = 3 position double acting pressure applied neutral

[3] Operator
0 = Solenoid
1 = Air

[4] Port sizes
15G = G1/2"
20G = G3/4"
25G = G1"

[5] Voltage code
RY = 110/120v 50/60Hz AC (standard)
SY = 220/240v 50/60Hz AC (standard)
KZ = 24v DC (option)

Preferred model selection

4F6 series - G1/2", G3/4"

Air operated two position	4F611-15G, 4F611-20G, 4F621-15G, 4F621-20G
Air operated three position	4F631-15G, 4F631-20G, 4F641-15G, 4F641-20G, 4F651-15G, 4F651-20G
Solenoid operated two position	4F610-15G-**, 4F610-20G-**, 4F620G-15G-**, 4F620G-20G-**
Solenoid operated three position	4F630-15G-**, 4F630-20G-**, 4F640-15G-**, 4F640-20G-**, 4F650-15G-**, 4F650-20G-*

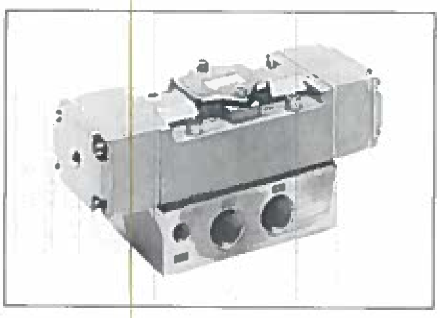
4F7 series - G3/4", G1"

Air operated two position	4F711-20G, 4F711-25G, 4F721-20G, 4F721-25G
Air operated three position	4F731-20G, 4F731-25G, 4F741-20G, 4F741-25G, 4F751-20G, 4F751-25G
Solenoid operated two position	4F710-20G-**, 4F710-25G-**, 4F720G-20G-**, 4F720G-25G-**
Solenoid operated three position	4F730-20G-**, 4F730-25G-**, 4F740-20G-**, 4F740-25G-**, 4F750-20G-**, 4F750-25G-**

*** = Solenoid voltage code - to be specified (see position [5] above)*

4. Operating data

Flow factors to ISO6358 (BS7294)	4F6 series - Kv = 70 (2 position), 62 (3 position) Cv = 4.89 (2 position), 4.35 (3 position) 4F7 series - Kv = 124, Cv = 8.7
Operating pressure	1.5 to 9.9 bar (22 to 145psig)
Minimum pilot air pressure	2 position valves - 1.5 bar (22 psig) 3 position valves - 2 bar (30 psig)
Ambient operating temperature range	-10°C to 60°C (14°F to 140°F)
Response times at 6.3bar (90psig)	4F6 series - 200msec 4F7 series - 300msec
Cycling rate	60 cycles per minute at 20°C (68°F) ambient
Type of connection	Main ports - 4F6 series G1/2" or G3/4", 4F7 series G3/4" or G1" Pilot exhaust port G1/4", Air pilot ports G1/8"
Materials of construction	Body & sub base - Die cast aluminium alloy Spool - Aluminium Seals - Nitrile
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Installation dimensions	See pages 4F 1.2
Mass	4F611 - 1.70kg 4F621 - 1.70kg 4F631, 4F641, 4F651 - 2.20kg 4F610 - 2.30kg 4F620 - 2.60kg 4F630, 4F640, 4F650 - 3.10kg 4F711 - 3.60kg 4F721 - 3.60kg 4F731, 4F741, 4F751 - 4.70kg 4F710 - 4.20kg 4F720 - 4.50kg 4F730, 4F740, 4F750 - 5.60kg
Solenoid coils	Class B moulded coil. Nominal voltages - See position [5] of model code above Voltage tolerance +10% to -10% Coil consumption at nominal voltage - 11W Starting current - 0.15/0.36amp(110vAC), 0.26/0.18amp(220vAC) Holding current - 0.23/0.16amp(110vAC), 0.12/0.08amp(220vAC) 0.46amp(24vDC)
Service kits	Details on request



Functional symbols

4F*11-**

5 port, 2 position.
Air actuated.
Pilot air spring return.

4F*21-**

5 port, 2 position.
Air actuated at both ends.

4F*31-**

5 port, 3 position.
Spring centred.
Air actuated at both ends.
Pressure held neutral.

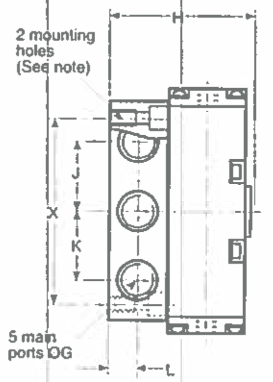
4F*41-**

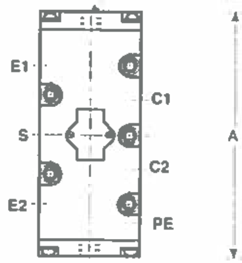
5 port, 3 position.
Spring centred.
Air actuated at both ends.
Pressure release neutral.

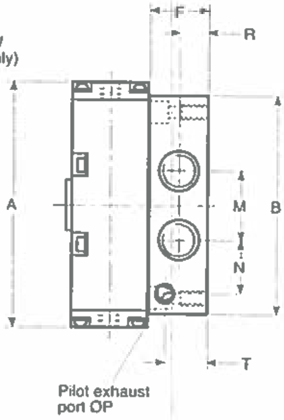
4F*51-**

5 port, 3 position.
Spring centred.
Air actuated at both ends.
Pressure applied neutral.

Installation dimensions in mm - Air operated valves

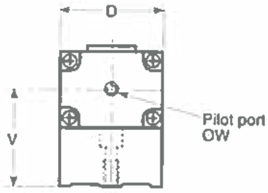




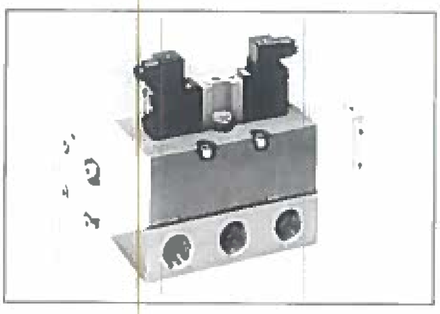


NOTE:
Mounting holes are drilled through "Oa", spot faced on top face "Ob" to a depth of "c" and tapped underside thread "d" to a depth "e":-

Series	a	b	c	d	e
4F6	9	16	15	M10	15
4F7	10.3	20	16.5	M12	23



Model number	A	B	D	F	G	H	J	K	L	M	N	P	R	T	V	W	X
4F611-15G, 4F621-15G	167	146	74	42	G1/2"	100	44	44	20	44	38	G1/4"	20	30	68	G1/8"	124
4F611-20G, 4F621-20G	167	146	74	42	G3/4"	100	44	44	20	44	38	G1/4"	20	30	68	G1/8"	124
4F631-15G, 4F641-15G, 4F651-15G	220	146	74	42	G1/2"	100	44	44	20	44	38	G1/4"	20	30	68	G1/8"	124
4F631-20G, 4F641-20G, 4F651-20G	220	146	74	42	G3/4"	100	44	44	20	44	38	G1/4"	20	30	68	G1/8"	124
4F711-20G, 4F721-20G	218	195	90	53.5	G3/4"	129	62	62	25	64	46	G1/4"	25	37	87	G1/8"	166
4F711-25G, 4F721-25G	218	195	90	53.5	G1"	129	62	62	25	64	46	G1/4"	25	37	87	G1/8"	166
4F731-20G, 4F741-20G, 4F751-20G	305	195	90	53.5	G3/4"	129	62	62	25	64	46	G1/4"	25	37	87	G1/8"	166
4F731-25G, 4F741-25G, 4F751-25G	305	195	90	53.5	G1"	129	62	62	25	64	46	G1/4"	25	37	87	G1/8"	166



Functional symbols

4F*10--****

5 port, 2 position.
Solenoid pilot actuated.
Pilot air spring return.

4F*20--C2-****

5 port, 2 position.
Solenoid pilot actuated at both ends.

4F*30--****

5 port, 3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Pressure held neutral.

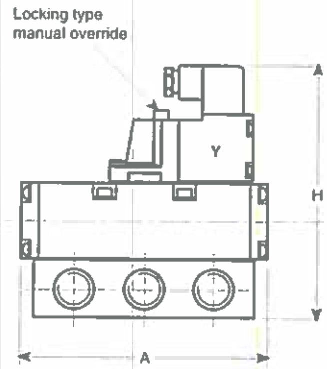
4F*40--****

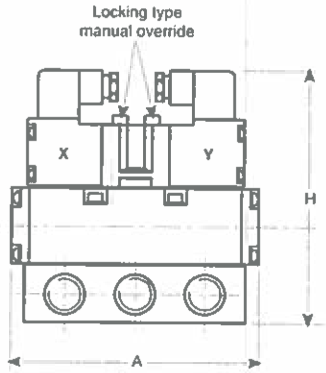
5 port, 3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Pressure release neutral.

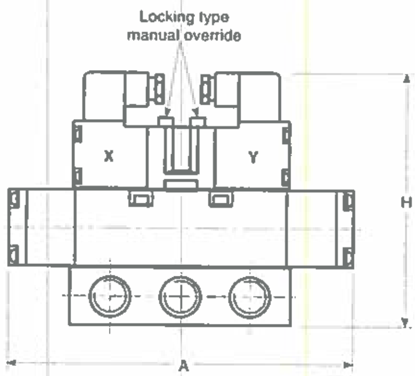
4F*50--****

5 port, 3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Pressure applied neutral.

Installation dimensions in mm - Solenoid operated valves







Model number	A	H
4F610-15G-**, 4F610-20G-**	167	176.5
4F620-15G-**, 4F620-20G-**	167	176.5
4F630-15G-**, 4F640-15G-**, 4F650-15G-**	220	176.5
4F630-20G-**, 4F640-20G-**, 4F650-20G-**	220	176.5
4F710-20G-**, 4F710-25G-**	218	203.5
4F720-20G-**, 4F720-25G-**	218	203.5
4F730-20G-**, 4F740-20G-**, 4F750-20G-**	305	203.5
4F730-25G-**, 4F740-25G-**, 4F750-25G-**	305	203.5

All other dimensions as for air operated versions above.

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
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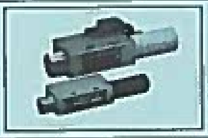
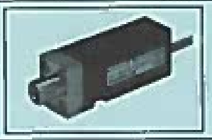
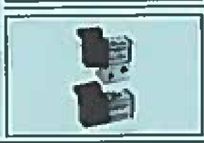
VACUUM PRODUCTS

Vacuum products

		Series	Function	Port size	Vacuum flow	Air consumption	Page numbers
Vacuum ejectors		CV	Air operated	G1/8" G1/4" G3/8"	56% 85% 90%	13 to 385 Nl/min	VAC 1.1
Vacuum switch		MVS	Electronic adjustable with LED	R1/8"			VAC 2.1
Vacuum filters		VF	In line mounting	G1/8" G1/4" R3/8"			VAC 2.2
Suction pads		PFG PFTM PFTF	Flat suction pads	1 mm to 280 mm diam			VAC 3.1
		PBG PBTM PBTF	1½ bellows suction pads	1 mm to 150 mm diam			VAC 3.2
Useful tables							VAC 4.1

Associated products

		Series	Function	Port size	Page numbers
Vacuum valves		3PA1 3PB1	3/2 N/O 3/2 N/C	M5 G1/8"	3PA 1.1 3PA 1.2 (Section 2)
See Section 2 - Solenoid and air operated directional control valves		3PA2 3PB2	3/2 N/O 3/2 N/C	G1/8" G1/4"	3PA 2.1 3PA 2.2 (Section 2)

The Power in Automation

VICKERS

Pneumatics

APPROVED TO BS EN ISO 9001
QUALITY STANDARD
CERTIFICATE No. C10705

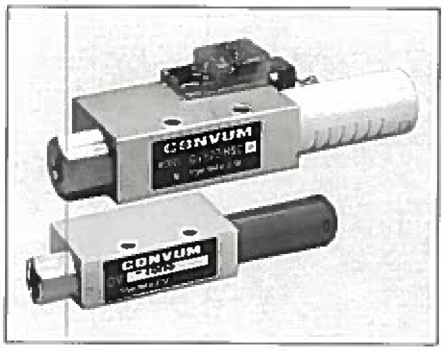
VACUUM PRODUCTS

SECTION 5

The Power in Automation

CONVUM vacuum products
Vacuum ejectors

Air operated
Series CV



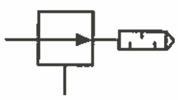
1. General description and application benefits

A range of air operated ejectors with built in silencer for high or low vacuum. Available with or without adjustable mechanical vacuum switch.

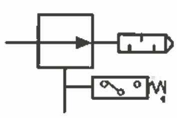
- High and low vacuum.
- 6 nozzle diameters.
- Available with built in switch.

2. Functional symbols

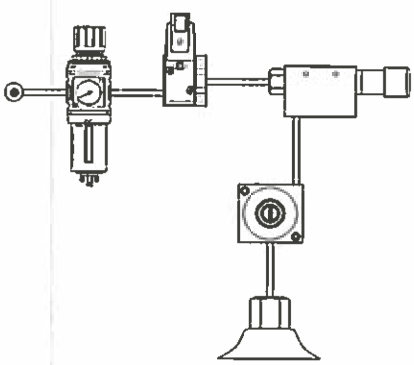
CV - **HS, CV - **LS



CV - **HSCK, CV - **LSCK



3. Installation configuration



4. Preferred model selection

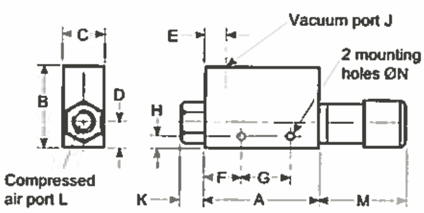
Standard model	Model with vacuum switch	Nozzle diam	Vacuum at 5bar air pressure	Vacuum flow	Air consumption
CV-05HS	CV-05HSCK	0.5mm	-0.85bar (85%)	6 Nl/min	13 Nl/min
CV-05LS	CV-05LSCK	0.5mm	-0.56bar (56%)	9 Nl/min	13 Nl/min
CV-10HS	CV-10HSCK	1.0mm	-0.90bar (90%)	27 Nl/min	44 Nl/min
CV-10LS	CV-10LSCK	1.0mm	-0.56bar (56%)	36 Nl/min	44 Nl/min
CV-15HS	CV-15HSCK	1.5mm	-0.90bar (90%)	63 Nl/min	100 Nl/min
CV-15LS	CV-15LSCK	1.5mm	-0.56bar (56%)	95 Nl/min	100 Nl/min
CV-20HS	CV-20HSCK	2.0mm	-0.90bar (90%)	110 Nl/min	180 Nl/min
CV-20LS	CV-20LSCK	2.0mm	-0.56bar (56%)	165 Nl/min	180 Nl/min
CV-25HS		2.5mm	-0.90bar (90%)	160 Nl/min	265 Nl/min
CV-25LS		2.5mm	-0.56bar (56%)	250 Nl/min	265 Nl/min
CV-30HS		3.0mm	-0.90bar (90%)	225 Nl/min	385 Nl/min
CV-30LS		3.0mm	-0.56bar (56%)	350 Nl/min	385 Nl/min

5. Operating data

Supply pressure	1.0 to 8 bar	
Operating medium	Filtered, non lubricated compressed air	
Ambient operating temperature range	-10°C to 80°C	
Body material	Anodized aluminium	
Vacuum switch	Setting range	-0.2 to -0.5bar
	Accuracy	±0.05bar
	Switching differential on/off	max 0.04 to 0.14bar
	Switching current	3A 220V AC
	Temperature range	0°C to 60°C
Mass	CV - 05HS, CV -05LS	80g
	CV - 10HS, CV -10LS	80g
	CV - 15HS, CV -15LS	140g
	CV - 20HS, CV - 20LS	350g
	CV - 25HS, CV - 25LS	750g
	CV - 30HS, CV - 30LS	850g
	CV - 05HSCK, CV -05LSCK	120g
	CV - 10HSCK, CV -10LSCK	120g
	CV - 15HSCK, CV -15LSCK	190g
	CV - 20HSCK, CV - 20LSCK	460g

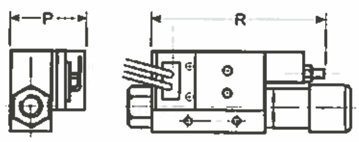
6. Installation dimensions in mm

CV - **HS, CV - **LS



Model	A	B	C	D	E	F	G	H	J	K	L	M	N
CV-05**	45	33	16	10	8	14	20	4.5	G1/8"	10	G1/8"	36	4.2
CV-10**	45	33	16	10	8	14	20	4.5	G1/8"	10	G1/8"	36	4.2
CV-15**	63	35	20	11	10	20	25	5	G1/4"	15	G1/8"	45.5	4.5
CV-20**	85	50	30	15	13	28	32	7	G3/8"	20	G1/4"	60.5	6
CV-25**	100	60	40	20	16	20	50	6	G1/2"	17	G3/8"	84	6
CV-30**	118	60	40	19	20	33	50	5	G3/4"	20	G1/2"	103	6

CV - **HSCK, CV - **LSCK

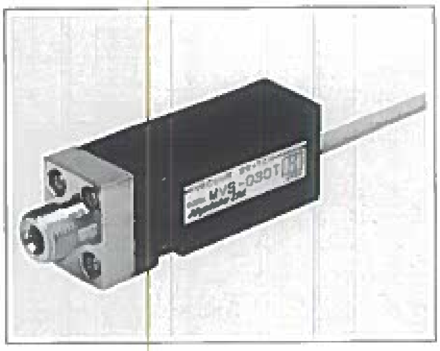


Model	P	R
CV-05**CK	30	78.5
CV-10**CK	30	78.5
CV-15**CK	34	96.5
CV-20**CK	44	118.5

Note:
All other dimensions as for standard models (on left)

CONVUM vacuum products
Accessories

Vacuum switch
Series MVS

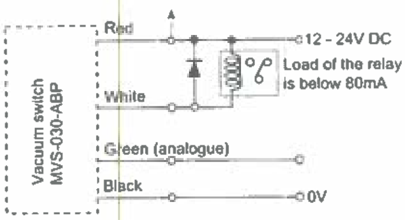


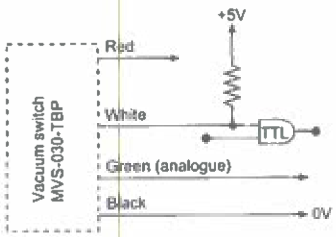
1. General description and application benefits

Electronic adjustable vacuum switch with LED indication for direct mounting.

- Direct mounting to ejectors.
- Digital or analog signal outputs.

2. Electrical circuits





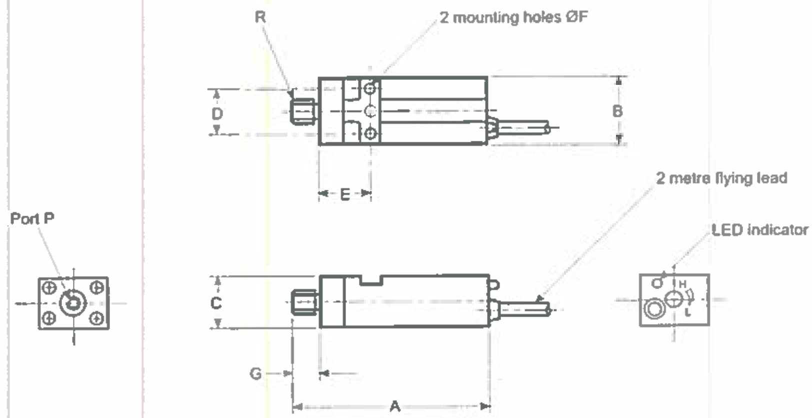
3. Preferred model selection

MVS-030-ABP	Vacuum switch
MVS-030-TBP	Vacuum switch with analog output

4. Operating data

Pressure range	0 to -1 bar
Accuracy	±0.03 bar
Switching differential on/off	0.04 bar ±0.015
Input voltage	12 to 24 V DC
Switching current	80 mA maximum
Operating temperature range	0°C to 50°C
Digital output indication	LED lights when vacuum reaches set value
Digital output form	PNP (NPN available on request)
Power consumption	20 mA maximum
Analog output	1 to 5 V DC for output load of over 10Ω
Mass	70g

5. Installation dimensions in mm



A	B	C	D	E	F	G	P	R
61	20	16	13.7	16	3.4	8.5	M5 x 8.5deep	R1/8"

CONVUM vacuum products
Accessories

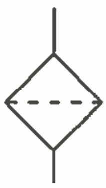
Vacuum filters
Series VF

1. General description and application benefits

Vacuum filter for in line mounting.

- Compact and lightweight.
- High efficiency.

2. Functional symbol



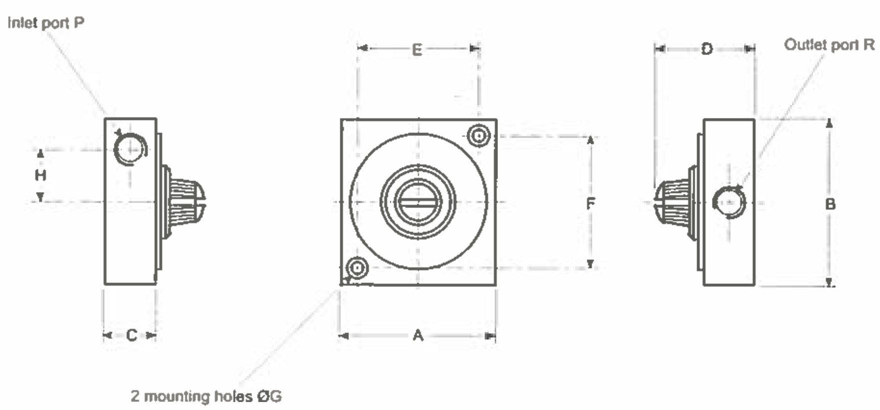
3. Preferred model selection

VF-3	G1/8" in line vacuum filter
VF-5	G1/4" in line vacuum filter
VF-6	R3/8" in line vacuum filter

4. Operating data

Pressure range	-1 to +5 bar	
Temperature range	0°C to 60°C	
Filtration	40 μ	
Body material	Anodized aluminium	
Mass	VF-3 VF-5 VF-6	90g 150g 235g
Spare element	VF-3 VF-5 VF-6	VF-3E VF-5E VF-6E

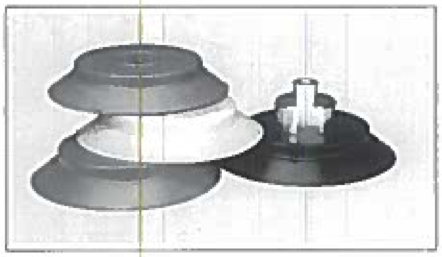
5. Installation dimensions in mm



Model number	A	B	C	D	E	F	G	H	P	R
VF-3	50.5	55.5	16	33	40	45	4.5	18	G1/8"	R1/8"
VF-5	50	65	25	42	40	45	4.5	23	G1/4"	G1/4"
VF-6	60	70	30	47	40	45	5.5	23	R3/8"	R3/8"

CONVUM vacuum products
Suction pads

Flat suction pads
Series PFG, PFTM, PFTF



1. General description and application benefits

A range of flat suction pads available as pad only, pad with standard male fitting or pad with standard female fitting.

- Wide selection of sizes and materials.
- Other connections available to order.
- Pad materials:-
  Standard - Nitrile, silicone
  Options - Urethane, flurocarbon, chloroprene

2. Preferred model selection

Diameter mm	Suction pad only	Suction pad with male fitting*	Suction pad with female fitting*
1	PFG - 1 - ***		
1.5	PFG - 1.5 - ***		
2 x 4	PFG - 2 x 4 - ***	PFTM - M5 - 2 x 4 - ***	
3.5 x 7	PFG - 3.5 x 7 - ***	PFTM - M5 - 3.5 x 7 - ***	
2	PFG - 2 - ***	PFTM - M5 - 2 - ***	
3.5	PFG - 3.5 - ***	PFTM - M5 - 3.5 - ***	
5	PFG - 5 - ***	PFTM - M5 - 5 - ***	
6	PFG - 6 - ***	PFTM - M5 - 6 - ***	
8	PFG - 8 - ***	PFTM - M5 - 8 - ***	
10	PFG - 10 - ***	PFTM - M5 - 10 - ***	
15	PFG - 15 - ***	PFTM - G1/8 - 15 - ***	PFTF - G1/8 - 15 - ***
20	PFG - 20 - ***	PFTM - G1/8 - 20 - ***	PFTF - G1/8 - 20 - ***
25	PFG - 25 - ***	PFTM - G1/8 - 25 - *** PFTM - G1/4 - 25 - ***	PFTF - G1/8 - 25 - *** PFTF - G1/4 - 25 - ***
30	PFG - 30 - ***	PFTM - G1/8 - 30 - *** PFTM - G1/4 - 30 - ***	PFTF - G1/8 - 30 - *** PFTF - G1/4 - 30 - ***
35	PFG - 35 - ***	PFTM - G1/8 - 35 - *** PFTM - G1/4 - 35 - ***	PFTF - G1/8 - 35 - *** PFTF - G1/4 - 35 - ***
40	PFG - 40 - ***	PFTM - G1/8 - 40 - *** PFTM - G1/4 - 40 - ***	PFTF - G1/8 - 40 - *** PFTF - G1/4 - 40 - ***
50	PFG - 50 - ***	PFTM - G1/8 - 50 - *** PFTM - G1/4 - 50 - ***	PFTF - G1/8 - 50 - *** PFTF - G1/4 - 50 - ***
60	PFG - 60 - ***	PFTM - G1/4 - 60 - ***	
80	PFG - 80-***	PFTM - G1/4 - 80 - ***	
95	PFG - 95 - ***	PFTM - G1/4 - 95 - ***	
120	PFG - 120 - ***		PFTF - G1/2 - 120 - ***
150	PFG - 150 - ***		PFTF - G1/2 - 150 - ***
200	PFG - 200 - ***		PFTF - G1/2 - 200 - ***
280	PFG - 280 - ***		

*Note: *** = Pad material:- NBR = Nitrile Si = Silicone U = Urethane FPM = Fluorocarbon CR = Chloroprene*

* Other connection options available - consult Customer Services

3. Operating data

Operating temperatures	Nitrile -30°C to +120°C Silicone -60°C to +200°C Urethane -25°C to +100°C Fluorocarbon -20°C to +230°C Chloroprene -20° to +120°
Theoretical lifting forces	See table and notes on page VAC 4.1

CONVUM vacuum products
Suction pads

1$^{1}/2$ bellows suction pads
Series PBG, PBTM, PBTF

1. General description and application benefits

A range of 1$^{1}/2$ bellows suction pads available as pad only, pad with standard male fitting or pad with standard female fitting.

- Wide selection of sizes and materials.
- Other connections available to order.
- Pad materials:-
  Standard - Nitrile, silicone

2. Preferred model selection

Diameter mm	Suction pad only	Suction pad with male fitting*	Suction pad with female fitting*
10	PBG - 10 - ***	PBTM - M5 - 10 - ***	
15	PBG - 15 - ***	PBTM - M5 - 15 - ***	
20	PBG - 20 - ***	PBTM - G1/8 - 20 - ***	PBTF - G1/8 - 20 - ***
30	PBG - 30 - ***	PBTM - G1/8 - 30 - *** PBTM - G1/4 - 30 - ***	PBTF - G1/8 - 30 - *** PBTF - G1/4 - 30 - ***
40	PBG - 40 - ***	PBTM - G1/8 - 40 - *** PBTM - G1/4 - 40 - ***	PBTF - G1/8 - 40 - *** PBTF - G1/4 - 40 - ***
50	PBG - 50 - ***	PBTM - G1/8 - 50 - *** PBTM - G1/4 - 50 - ***	PBTF - G1/8 - 50 - *** PBTF - G1/4 - 50 - ***
75	PBG - 75 - ***	PBTM - G1/4 - 75 - ***	
110	PBG - 110 - ***		PBTF - G1/2 - 110 - ***
150	PBG - 150 - ***		PBTF - G1/2 - 150 - ***

*Note: *** = Pad material:- NBR = Nitrile Si = Silicone*

* Other connection options available - consult Customer Services

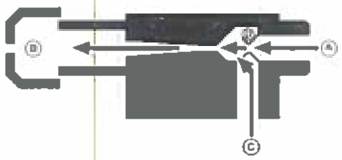
3. Operating data

Operating temperatures	Nitrile -30°C to +120°C Silicone -60°C to +200°C
Theoretical lifting forces	See table and notes on page VAC 4.1

CONVUM vacuum products
Useful tables

1. Conversion tables

	Bar, 10^3 mbar, 10N/cm², 100KPa	at, kp/cm², 10^4 mm H_2O	Torr, mm Hg	Atm	psi, lbf/in²	in Hg
Bar, 10^3 mbar, 10N/cm², 100KPa	1	1.019 716	750.063 8	0.986 923	14.503 77	29.530 07
at, kp/cm², 10^4 mmH_2O	0.980 665	1	735.559 1	0.967 841	14.223 34	28.960 24
Torr, mmHg	0.001 333	0.001 360	1	0.001 316	0.019 337	0.039 370
Atm	1.013 250	1.033 227	760	1	14.695 95	29.921 n26
psi, lbf/in²	0.068 948	0.070 307	51.714 94	0.068 046	1	2.036 021
inHg	0.033 864	0.034 530	25.4	0.033 421	0.491 154	1



The CONVUM ejector operates on the Venturi principle.
The compressed air (A), filtered, non lubricated, is blown through nozzle (D) at high speed in the diffuser and exhausted via the silencer to atmosphere (B).
Vacuum is created into the chamber around the nozzle causing air to flow from (C) via (D) to (B).
Maintenance is practically not required since the ejector has no moving parts.

Vacuum degree	Bar, 10^3 mbar 10N/cm², 100KPa	at kp/cm² 10^4 mm H_2O	Torr mm Hg	Atm	psi lbf/in²	in Hg
5%	-0.051	-0.052	-38	-0.05	-0.725	-1.477
10%	-0.101	-0.103	-76	-0.1	-1.450	-2.953
15%	-0.152	-0.155	-114	-0.15	-2.176	-4.430
20%	-0.203	-0.207	-152	-0.2	-2.901	-5.906
25%	-0.253	-0.258	-190	-0.25	-3.626	-7.383
30%	-0.304	-0.310	-228	-0.3	-4.351	-8.859
35%	-0.355	-0.362	-266	-0.35	-5.076	-10.34
40%	-0.405	-0.413	-304	-0.4	-5.802	-11.81
45%	-0.456	-0.465	-342	-0.45	-6.527	-13.29
50%	-0.507	-0.517	-380	-0.5	-7.252	-14.77
55%	-0.557	-0.568	-418	-0.55	-7.977	-16.24
60%	-0.608	-0.620	-456	-0.6	-8.702	-17.72
65%	-0.659	-0.672	-494	-0.65	-9.427	-19.19
70%	-0.709	-0.723	-532	-0.7	-10.15	-20.67
75%	-0.760	-0.775	-570	-0.75	-10.88	-22.15
80%	-0.811	-0.827	-608	-0.8	-11.60	-23.62
85%	-0.861	-0.878	-646	-0.85	-12.33	-25.10
90%	-0.912	-0.930	-684	-0.9	-13.05	-26.58
95%	-0.963	-0.982	-722	-0.95	-13.78	-28.05

2. Theoretical lifting forces

Standard circular pads

Suction pad diameter (mm)	Area (cm²)	Theoretical lifting force (N) at vacuum degree (%) 10	20	30	40	50	60	70	80	90
1	0.008	0.008	0.016	0.024	0.032	0.040	0.048	0.056	0.064	0.072
1.5	0.017	0.017	0.034	0.051	0.068	0.085	0.103	0.119	0.136	0.153
2	0.031	0.031	0.062	0.093	0.124	0.156	0.187	0.218	0.249	0.280
3.5	0.096	0.095	0.191	0.286	0.382	0.478	0.573	0.669	0.764	0.860
5	0.196	0.195	0.390	0.585	0.780	0.975	1.170	1.365	1.560	1.755
6	0.282	0.280	0.561	0.842	1.123	1.404	1.685	1.966	2.247	2.528
8	0.502	0.499	0.998	1.498	1.997	2.497	2.996	3.496	3.995	4.495
10	0.785	0.780	1.560	2.341	3.121	3.902	4.682	5.462	6.243	7.023
15	1.767	1.755	3.511	5.267	7.023	8.779	10.53	12.29	14.04	15.80
20	3.141	3.121	6.243	9.365	12.48	15.60	18.73	21.85	24.97	28.09
25	4.908	4.877	9.755	14.63	19.51	24.38	29.26	34.14	39.02	43.89
30	7.068	7.023	14.04	21.07	28.09	35.11	42.14	49.16	56.19	63.21
35	9.621	9.560	19.12	28.68	38.24	47.80	57.36	66.92	76.48	86.04
40	12.56	12.48	24.97	37.46	49.94	62.43	74.92	87.40	99.89	112.3
50	19.63	19.51	39.02	58.53	78.04	97.55	117.0	136.5	156.0	175.5
60	28.27	28.09	56.19	84.28	112.3	140.4	168.5	196.6	224.7	252.8
80	50.26	49.94	99.89	149.8	199.7	249.7	299.6	349.6	399.5	449.5
95	70.88	70.43	140.8	211.2	281.7	352.1	422.5	493.0	563.4	633.8
120	113.0	112.3	224.7	337.1	449.5	561.9	674.2	786.6	899.0	1,011
150	176.7	175.5	351.1	526.7	702.3	877.9	1,053	1,229	1,404	1,580
200	314.1	312.1	624.3	936.5	1,248	1,560	1,873	2,185	2,497	2,809
280	615.6	615.6	1,231	1,847	2,462	3,078	3,694	4,309	4,925	5,540

Standard oval pads

Suction pad diameter (mm)	Area (cm²)	Theoretical lifting force (N) at vacuum degree (%) 10	20	30	40	50	60	70	80	90
2 x 4	0.071	0.071	0.143	0.214	0.285	0.357	0.428	0.500	0.571	0.643
3.5 x 7	0.218	0.217	0.434	0.651	0.869	1.086	1.303	1.521	1.738	1.955

Theoretical lifting force F

$$F = A \times V \times 0.099366$$

Where F = Force (N)
A = Pad area (cm2)
V = Vacuum degree (%)
(1N = 0.10197kp, 1kp = 9.80665N)

Effective lifting forces can be less than 50% of the theoretical lifting forces due to deformation and cleanliness of the suction pads and the contact surfaces of the objects to be lifted.
Therefore a safety factor of at least 2 should always be used and a factor of 3 is recommended.

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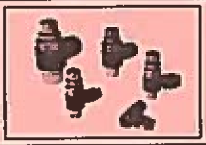
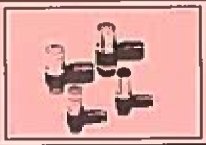
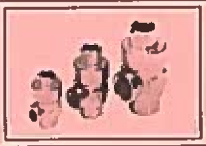
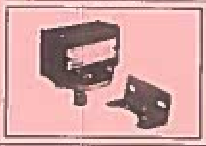
APPROVED TO BS EN ISO 9001 QUALITY STANDARD CERTIFICATE No. Q10706

ANCILLARY PRODUCTS

		Series	Function	Inlet port	Outlet port	Flow to atmosphere	Page numbers
Banjo flow regulators		SC3G	Banjo design	M5 R1/8" R1/4" R3/8" R1/2"	4mm 6mm 8mm 10mm 12mm	1.3 dm³/sec to 26.7 dm³/sec	ASC 1.1 ASC 1.2
In line flow regulators		AFR	In line design	M5 G1/8" G1/4" G1/2" G3/4" G 1"	M5 G1/8" G1/4" G1/2" G3/4" G 1"	2.5 dm³/sec to 350 dm³/sec	AFR 1.1 AFR 1.2
Port flow regulators		FMS PRO	Silencer combined	M5 R1/8" R1/4" R1/2"			APR 1.1 APR 1.2
Soft start fittings		ASA ASV	Banjo design	G1/4" G3/8" G1/2"	8mm 12mm	25 dm³/sec to 51.8 dm³/sec	ASS 1.1 ASS 1.2 ASS 1.3 ASS 1.4
Non return valves		ANR	In line design	G1/8" G1/4" G1/2"	G1/8" G1/4" G1/2"	25 dm³/sec to 170 dm³/sec	ANR 1.1 ANR 1.2
Shuttle/Tee valves		ATV AQE	Free standing	G1/8" G1/4" G1/2"	G1/8" G1/4" G1/2"	11 dm³/sec to 55 dm³/sec	ATV 1.1 ATV 1.2
Quick exhaust valves		AQE	Free standing	G1/8" G1/4" G1/2"	G1/8" G1/4" G1/2"	16 dm³/sec to 85 dm³/sec	AQE 1.1 AQE 1.2
Stop valves		STV	In line design	G1/4" G3/8" G1/2" G3/4" G1"	G1/4" G3/8" G1/2" G3/4" G1"		STV 1.1 STV 1.2
Silencers		PS PSP	Push in and Screw in designs	4mm to 12mm M5 to G1"			AS 1.1 AS 1.2

APPROVED TO BS EN ISO 9001 QUALITY STANDARD CERTIFICATE No. Q10706

ANCILLARY PRODUCTS

		Series	Function	Inlet port	Outlet port	Flow to atmosphere	Page numbers
Pressure switches		**PS013**	**Compact design**	**G1/8"**			**PS 2.1** **PS 2.2**
		**PS025**	**In line design**	**G1/4"**			**PS 1.1** **PS 1.2**

VICKERS

Banjo flow regulators

SC3G Series
M5, 1/8", 1/4", 3/8", 1/2"BSP

1. General description and application benefits

A range of unidirectional flow control regulators of banjo coupling design.

- Excellent flow characteristics
  - Large adjusting range and fine adjustment
- Use for controlling speed of cylinders
  - Free flow in, metered flow out
- Compact and lightweight
  - Enables greatly reduced piping space
- Safety mechanism
  - Needle not removable in fully open position
- Metal parts
  - Brass nickel plated

2. Functional symbol

3. Model code

S C 3 G - * * - * *

[1] [2]

[1] Supply connection
M5 = M5 x 0.8 thread
6 = 1/8" thread
8 = 1/4" thread
10 = 3/8" thread
15 = 1/2" thread

[2] Inlet connection
4 = 4mm o/d tube
6 = 6mm o/d tube
8 = 8mm o/d tube
10 = 10mm o/d tube
12 = 12mm o/d tube

Note:- *Inlet connection is of push-in type.*

Preferred model selection

The products listed represent the standard product range most readily available.

SC3G-M5-4	Banjo flow regulator M5 x 4mm o/d tube
SC3G-M5-6	Banjo flow regulator M5 x 6mm o/d tube
SC3G-6-4	Banjo flow regulator 1/8" BSP taper x 4mm o/d tube
SC3G-6-6	Banjo flow regulator 1/8" BSP taper x 6mm o/d tube
SC3G-6-8	Banjo flow regulator 1/8" BSP taper x 8mm o/d tube
SC3G-8-6	Banjo flow regulator 1/4" BSP taper x 6mm o/d tube
SC3G-8-8	Banjo flow regulator 1/4" BSP taper x 8mm o/d tube
SC3G-8-10	Banjo flow regulator 1/4" BSP taper x 10mm o/d tube
SC3G-10-8	Banjo flow regulator 3/8" BSP taper x 8mm o/d tube
SC3G-10-10	Banjo flow regulator 3/8" BSP taper x 10mm o/d tube
SC3G-10-12	Banjo flow regulator 3/8" BSP taper x 12mm o/d tube
SC3G-15-12	Banjo flow regulator 1/2" BSP taper x 12mm o/d tube

4. Operating data

Flow to atmosphere at 6.3bar (90psig) body pressure (free flow)

Model	Flow	
SC3G-M5-4	1.3dm³/sec	(2.8scfm)
SC3G-M5-6	1.3dm³/sec	(2.8scfm)
SC3G-6-4	3.5dm³/sec	(7.4scfm)
SC3G-6-6	4.5dm³/sec	(9.6scfm)
SC3G-6-8	4.5dm³/sec	(9.6scfm)
SC3G-8-6	7.8dm³/sec	(16.6scfm)
SC3G-8-8	8.4dm³/sec	(17.7scfm)
SC3G-8-10	8.9dm³/sec	(18.8scfm)
SC3G-10-8	16.6dm³/sec	(35.2scfm)
SC3G-10-10	18.3dm³/sec	(38.8scfm)
SC3G-10-12	18.3dm³/sec	(38.8scfm)
SC3G-15-12	26.7dm³/sec	(56.6scfm)

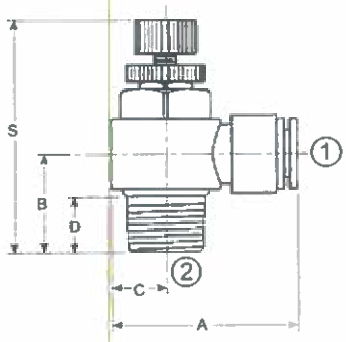
Operating pressure	0.5 - 10bar (7.25 - 145psig)
Ambient operating temperature range	-10°C to + 60°C (14°F to + 140°F)
Type of connection	Screwthread and push-in collet
Materials of construction	Body - Thermoplastic moulding Spindle - Nickel plated brass Seals - Nitrile
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Installation dimensions	See below

Mass

Model	Mass
SC3G-M5-4	0.010kg (0.02lb)
SC3G-M5-6	0.011kg (0.02lb)
SC3G-6-4	0.025kg (0.05lb)
SC3G-6-6	0.026kg (0.06lb)
SC3G-6-8	0.027kg (0.06lb)
SC3G-8-6	0.050kg (0.11lb)
SC3G-8-8	0.051kg (0.11lb)
SC3G-8-10	0.054kg (0.12lb)
SC3G-10-8	0.076kg (0.17lb)
SC3G-10-10	0.081kg (0.18lb)
SC3G-10-12	0.088kg (0.19lb)
SC3G-15-12	0.138kg (0.30lb)

Service kits	Replace unit

5. Installation dimensions in mm



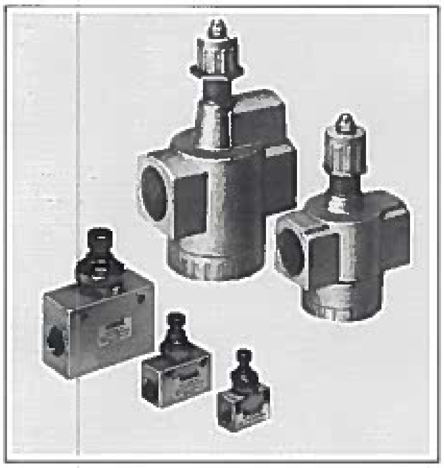
Part number	Port ① Tube o/d	Port ② M or R	A	B	C	D	S (max)
SC3G-M5-4	4	M5	28.2	13	5.2	4	33.4
SC3G-M5-6	6	M5	28.2	12.3	5.2	4	33.4
SC3G-6-4	4	1/8"	32.5	20.4	7.5	8	42.7
SC3G-6-6	6	1/8"	32.5	20.4	7.5	8	42.7
SC3G-6-8	8	1/8"	34	19.5	7.5	8	42.7
SC3G-8-6	6	1/4"	36.7	24.9	9.5	11	51.2
SC3G-8-8	8	1/4"	38	24.9	9.5	11	51.2
SC3G-8-10	10	1/4"	41.5	23.9	9.5	11	51.2
SC3G-10-8	8	3/8"	41.6	29.8	11.3	12	60.2
SC3G-10-10	10	3/8"	45.1	30	11.3	12	60.2
SC3G-10-12	12	3/8"	49.1	29.3	11.3	12	60.2
SC3G-15-12	12	1/2"	53.5	33.8	13.5	15	66.7

6. Ordering procedure

Order as preferred model selection to suit installation requirements.

In - line flow regulators

AFR / SC Series
M5, 1/8", 1/4", 3/8", 1/2", 3/4", 1", 1¼", 1½", 2" BSP



Preferred model selection

The products listed represent the standard product range most readily available.

AFRM5	In-line flow regulator M5
AFR10G	In-line flow regulator 1/8" BSP Parallel
AFR20G	In-line flow regulator 1/4" BSP Parallel
AFR40G	In-line flow regulator 1/2" BSP Parallel
SC-20A	In-line flow regulator 3/4" BSP Taper
SC-25A	In-line flow regulator 1" BSP Taper
SC-32A	In-line flow regulator 1¼" BSP Taper
SC-40A	In-line flow regulator 1½" BSP Taper
SC-50A	In-line flow regulator 2" BSP Taper

1. General description and application benefits

A range of unidirectional flow control regulators of in-line design.

- Simple reliable design.
- Use for controlling speed of cylinders
  - Free flow in, metered flow out.
- Ease of mounting.
- Large range: M5 - 2"

2. Functional symbol

3. Model code

M5, 1/8", 1/4", 1/2"

A	F	R	*	*	*
				1	

[1] **End connections**

M5 = M5 x 0.8 20G = G1/4"
10G = G1/8" 40G = G1/2"

3/4", 1", 1¼, 1½, 2"

S	C	-	*	*	*
				1	

[1] **End connections**

20A = Rc3/4" 40A=Rc1½
25A = Rc1" 50A=Rc2"
32A = Rc1¼

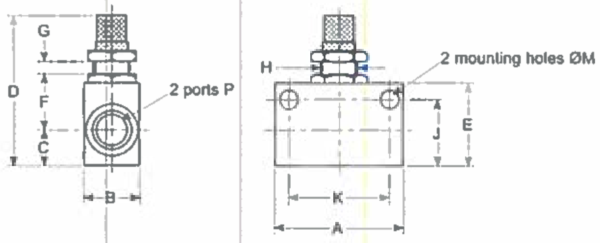
4. Operating data

Flow to atmosphere at 6.3bar (90psig) body pressure (free flow) (needle closed)	AFRM5 AFR10G AFR20G AFR40G	1.92dm³/sec (4.1scfm) 5.33dm³/sec (11scfm) 9.20dm³/sec (20scfm) 28.3dm³/sec (60scfm)
Flow to atmosphere at 5.0bar (72psig) body pressure (free flow)	SC-20A SC-25A SC-32A SC-40A SC-50A	172dm³/sec (364scfm) 290dm³/sec (614scfm) 1133dm³/sec (2400scfm) 1133dm³/sec (2400scfm) 1617dm³/sec (3426scfm)
Operating pressure	0.5 - 10bar (7.25 - 145psig)	
Ambient operating temperature range	-10° C to + 60° C (14° F to + 140° F)	
Type of connection	Screwthread	
Materials of construction	Body - Aluminium alloy (AFR series) Zinc alloy (SC series) Seals - Nitrile	
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG 32 mineral oil.	
Installation dimensions	See page AFR 1.2	
Mass	AFRM5 AFR10G AFR20G AFR40G SC-20A SC-25A SC-32A SC-40A SC-50A	0.023kg (0.05lb) 0.054kg (0.12lb) 0.08kg (0.18lb) 0.19kg (0.42lb) 0.80kg (1.76lb) 1.40kg (3.09lb) 4.00kg (8.80lb) 4.00kg (8.80lb) 4.00kg (8.80lb)
Service kits	Contact Customer Services Department for details.	

5. Installation dimensions in mm

AFRM5

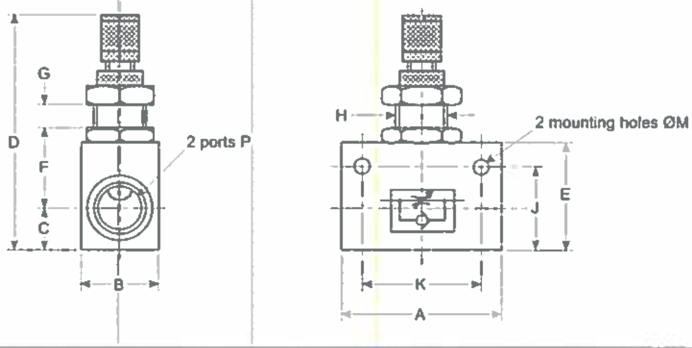
Note: *Clockwise operation of control knob DECREASES flow.*



Part number	Port P	A	B	C	D	E	F	G (max)	H	J	K	M
AFRM5	M5	21	14	6.4	36	16	11.6	3.3	M10x0.75	12.5	15	4.2

AFR10G, AFR20G, AFR40G

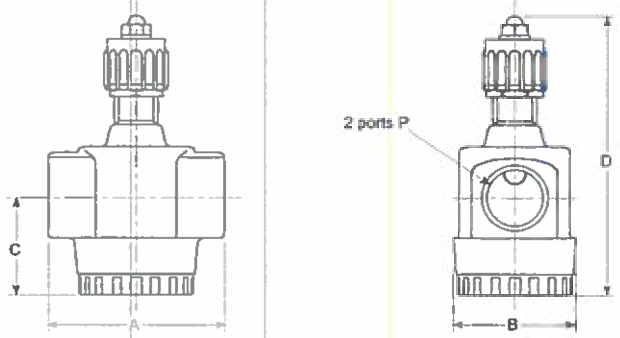
Note: *Clockwise operation of control knob DECREASES flow.*



Part number	Port P	A	B	C	D	E	F	G (max)	H	J	K	M
AFR10G	G1/8"	31	16	10	47.5	22	15	5.5	M12 x 1.0	18.2	24.7	4.2
AFR20G	G1/4"	45	20	11	53.5	30	22	5.0	M12 x 1.0	24.5	35	6.4
AFR40G	G1/2"	59	30	19.5	67	40	24	7.5	M15 x 1.0	35	44	6.4

SC-20A, SC-25A

Note: *Clockwise operation of control knob INCREASES flow.*

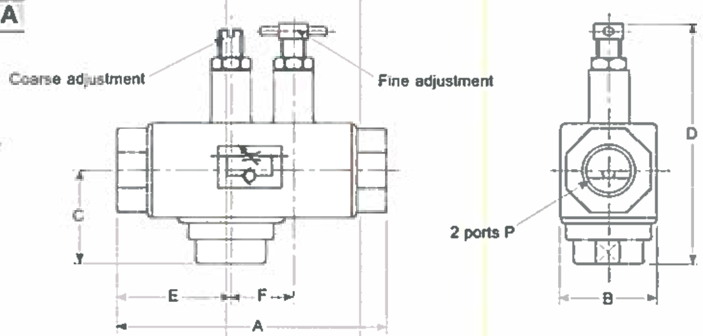


Part number	Port P	A	B	C	D
SC-20A	Rc3/4"	74	50	42	115
SC-25A	Rc1"	90	61	55	156

SC-32A, SC-40A, SC-50A

Note: *Clockwise operation of coarse adjustment screw INCREASES flow.*

Clockwise operation of fine adjustment screw DECREASES flow.



Part number	Port P	A	B	C	D	E	F
SC-32A	Rc1$^{1}/_{4}$"	210	75	77	200	92	50
SC-40A	Rc1$^{1}/_{2}$"	210	75	77	200	92	50
SC-50A	Rc2"	222	84	79	200	96	50

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Printed in Great Britain

GB-P5005-FR-0396

Port flow regulators

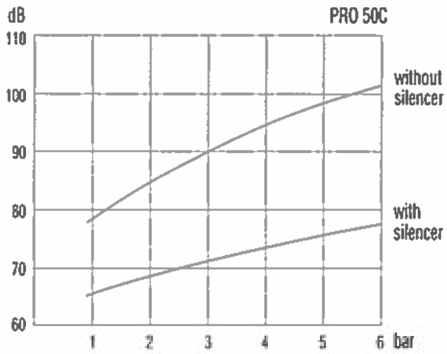
FMS and PRO Series
M5, 1/8", 1/4", 1/2" BSP

2. Noise at work regulations 1989

The Noise at Work Regulations 1989 act which came into force in January 1990 places an obligation on both employer and employee to minimise the risk of damage to hearing at the workplace.

The fitting of Vickers port flow regulator/ silencer units will not only control the speed of pneumatic cylinders but will help to reduce the noise of exhaust air to an acceptable level below 85dB (A).

Exhaust noise of a 1/2" 5/2 valve controlling an air cylinder of bore size 80mm



1. General description and application benefits

Combined exhaust port flow restrictor and silencer having brass body with porous bronze silencer chamber (cleanable).

- Captive regulating needle.
- Hidden adjusting screw.
- Ease of controlling speed of cylinders.
- Reduces noise level.
- Simple reliable design.
- Sintered bronze units easily cleaned.

3. Functional symbol

4. Preferred model selection

The products listed represent the standard product range most readily available.

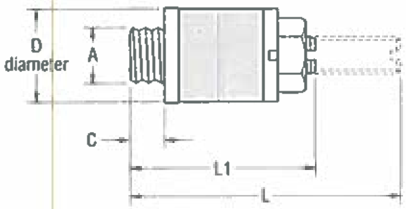
FMS - M5	Port flow regulator M5
PRO - 13C	Port flow regulator 1/8" BSP Taper
PRO - 25C	Port flow regulator 1/4" BSP Taper
PRO - 50C	Port flow regulator 1/2" BSP Taper

5. Operating Data

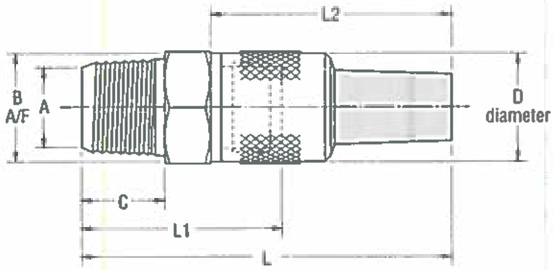
Operating pressure	0 – 10 bar (0 – 145 psig)		
Ambient operating temperature range	0°C to +70°C (+32°F to +158°F)		
Type of connection	Screwthread		
Port sizes	M5 – 1/2" BSP		
Materials of construction	Body – Brass Seats – Nitrile Silencer chamber – Porous bronze		
Installation dimensions	See overleaf		
Mass	FMS - M5	0.006kg	(0.01lb)
	PRO13C	0.031kg	(0.07lb)
	PRO25C	0.036kg	(0.08lb)
	PRO50C	0.109kg	(0.24lb)
Service kits	Replace unit		

6. Installation dimensions in mm (inches)

FMS - M5



PRO13C, PRO25C, PRO50C



Model	A	B	C	D	L	L1	L2
FMS - M5	M5		4.0 (0.16)	10 (0.39)	23.5 (0.92)	18.5 (0.73)	
PRO13C	R1/8"	15 (0.59)	9.5 (0.37)	15 (0.59)	48 (1.89)	25.5 (1.00)	30.5 (1.20)
PRO25C	R1/4"	15 (0.59)	11.0 (0.43)	15 (0.59)	49 (1.93)	27.5 (1.08)	30.5 (1.20)
PRO50C	R1/2"	24 (0.94)	15.9 (0.63)	24 (0.94)	71 (2.79)	37 (1.46)	47.5 (1.87)

7. Ordering procedure

Order as preferred model selection to suit installation requirements.

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Printed in Great Britain

GB-P5005-PR-0692

Soft start fittings

ASA and ASV Series 1/4", 3/8", 1/2" BSP

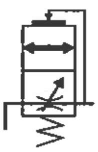
1. General description and application benefits

Function fittings which allow air pressure to gradually increase when a compressed air line is restarted after it has been vented for any reason.
This gradual increase in pressure, or "soft start", ensures that protected items such as cylinders gradually return to the position they stopped in when the system was vented.

- Prevents shocks to the system.
- Prevents injury to users and components.
- Replaces any normal fittings without circuit modification.
- No external pilot supply required.

2. Functional symbols

ASA series



ASV series

3. Model code

A	S	*	–	* *	*	–	* *	*
		1		2	3		4	5

1 **Product type**
A = Air set mounted
V = Valve mounted

2 **Male connection**
20 = 1/4" thread
30 = 3/8" thread
40 = 1/2" thread

3 **Type of thread**
G = BSP Parallel

4 **Female connection**
08 = 8mm Push-in
12 = 12mm Push-in

5 **Type of thread**
P = Push-in

Preferred model selection

The products listed represent the standard product range most readily available.

Air set mounted

ASA – 20G – 08P	Soft start valve 1/4" BSP Parallel x 8mm o/d tube
ASA – 30G – 12P	Soft start valve 3/8" BSP Parallel x 12mm o/d tube
ASA – 40G – 12P	Soft start valve 1/2" BSP Parallel x 12mm o/d tube

Valve mounted

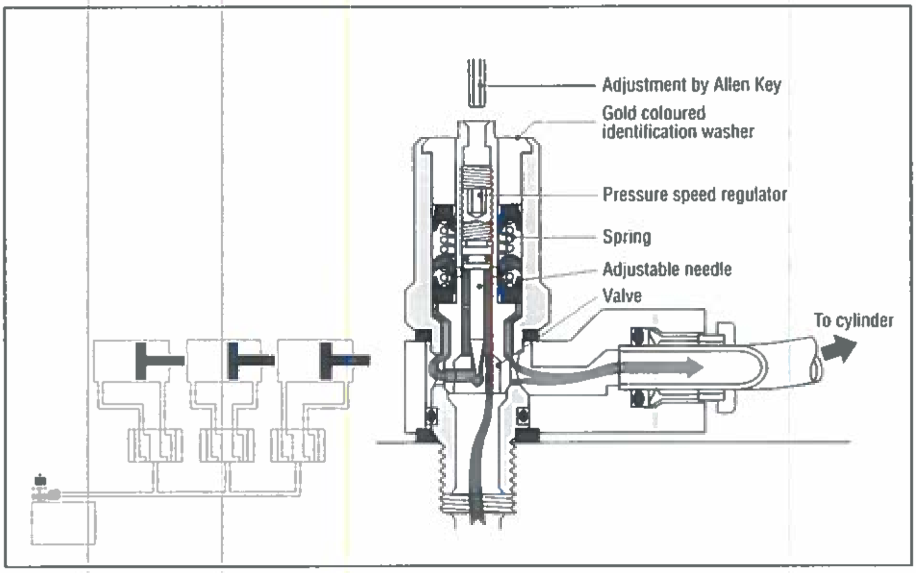
ASV – 20G – 08P	Soft start valve 1/4" BSP Parallel x 8mm o/d tube

4. Principles of operation

Two versions of slow start units are available:-

ASA Series
Air set mounted

Mounted on the F.R.L. outlet this version protects the whole downstream installation.



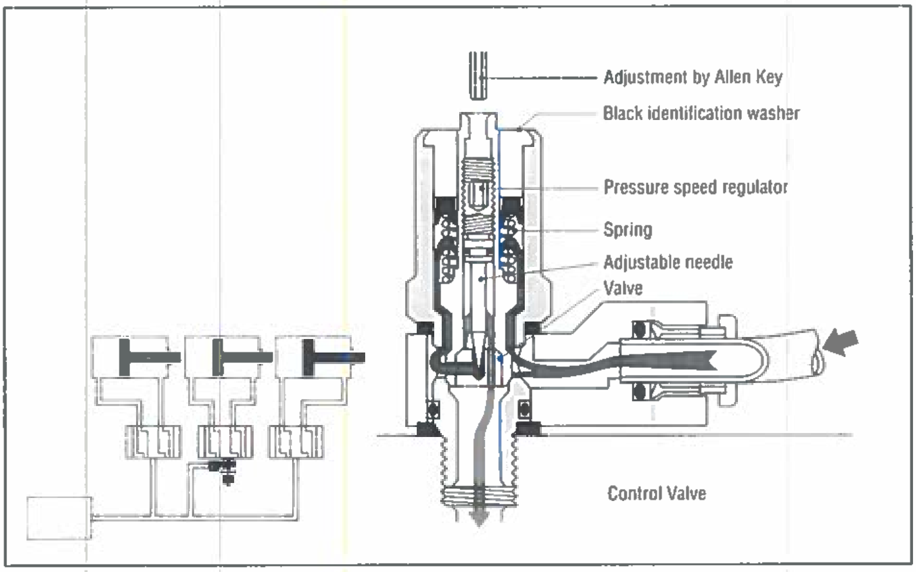
When restarting the circuit after a cut in air supply the soft start unit allows air pressure to increase gradually so that cylinders slowly return to their end-of-stroke position one after the other depending on their resistive forces.

A needle valve regulates the speed of pressurisation. The starting adjustment is common to all cylinders downstream of the soft start unit. Once the soft start unit has opened fully the system works under normal flow and pressure conditions.

ASV Series
Valve mounted

Mounted to the supply port of the control valve or the common supply line of several associated valves. The action of the fitting is immediate and controls directly the designated cylinders.

The soft start fittings open fully when downstream pressure equals 2/3rds upstream pressure.



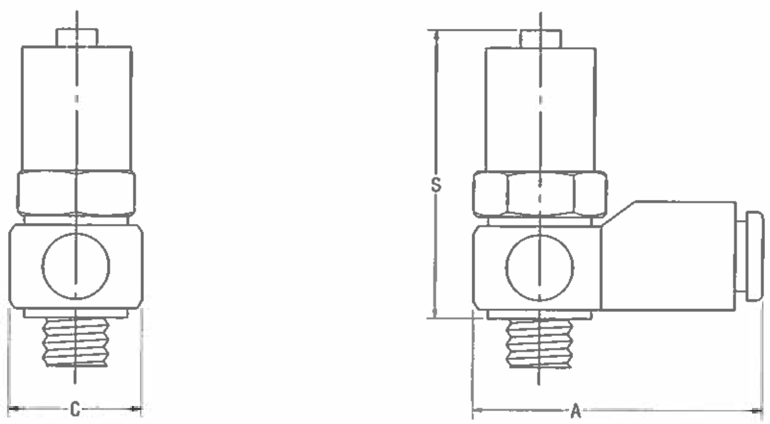
When starting or restarting a circuit the soft start unit is supplied at full system pressure and reduces the pressure to the cylinder, via the control valve. The pressurisation speed of the control valve, or group of valves, can be adjusted to an optimum. When the system is pressurised cylinders return to their end-of-stroke position one after another depending on their resistive forces. Having opened fully and completely the soft start unit allows full flow and pressure which enables the cylinders to cycle normally.

***Note:** When the system stops, the circuit vents through the soft start fitting in "valve open" condition until the residual pressure virtually reaches zero. Then the valve recovers its initial position.*

5. Operating Data

Flow to atmosphere at 6.3 bar (90 psig) body pressure	ASA – 20G – 08P 25.0 dm³/sec (53.1 scfm) ASA – 30G – 12P 51.8 dm³/sec (109.7 scfm) ASA – 40G – 12P 51.8 dm³/sec (109.7 scfm) ASV – 20G – 08P 25.0 dm³/sec (53.1 scfm)
Operating pressure	3.0 - 10 bar (43.5 - 145 psig)
Ambient operating temperature range	–10°C to +75°C (+14°F to +167°F)
Type of connection	Screwthread and push-in collet
Port sizes	1/4" - 1/2" BSP
Materials of construction	Body - Engineering grade plastic Sub assembly - Nickel plated brass with integral sealing washers. ASA series valves have gold coloured identification top - ASV series have black identification top.
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG37 mineral oil.
Installation dimensions	See below
Mass	ASA – 20G – 08P 0.067 kg (0.15 lb) ASA – 30G – 12P 0.124 kg (0.27 lb) ASA – 40G – 12P 0.155 kg (0.34 lb) ASV – 20G – 08P 0.067 kg (0.15 lb)
Service kits	Replace unit

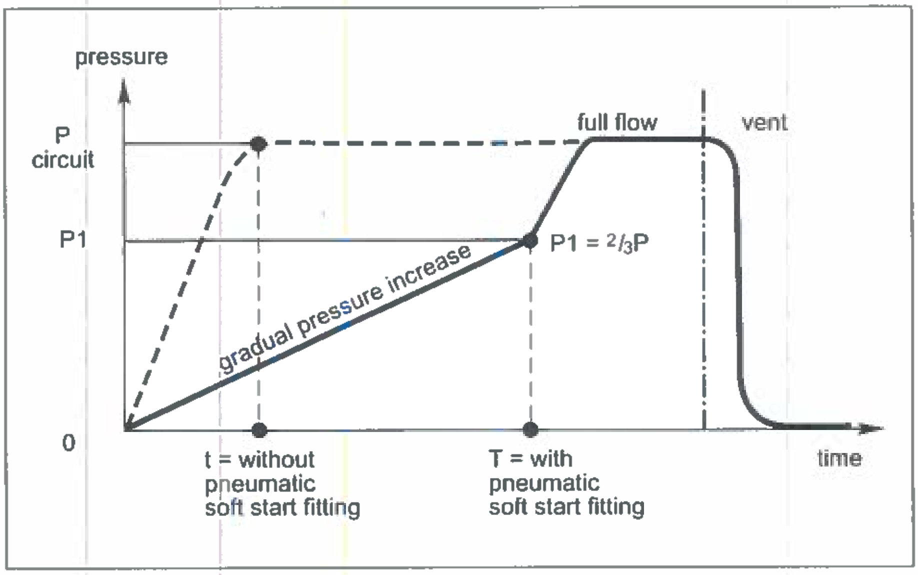
6. Installation dimensions in mm (inches)



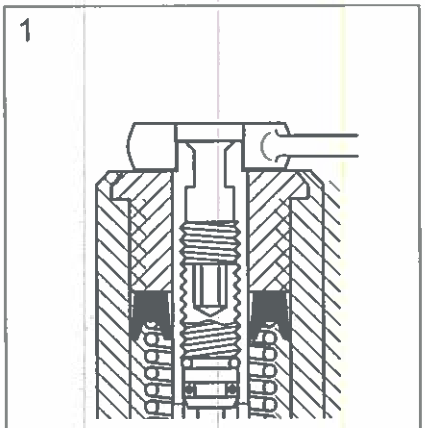
Model code	BSP	Push-in tube	A	C	S(min)	S(max)
ASA – 20G – 08P	1/4"	8	33.0 (1.30)	8.0 (0.31)	54.0 (2.13)	61.0 (2.40)
ASA – 30G – 12P	3/8"	12	57.5 (2.26)	12.5 (0.49)	55.0 (2.17)	62.0 (2.44)
ASA – 40G – 12P	1/2"	12	57.5 (2.26)	12.5 (0.49)	63.5 (2.50)	70.5 (2.78)
ASV – 20G – 08P	1/4"	8	33.0 (1.30)	8.0 (0.31)	54.0 (2.13)	61.0 (2.40)

7. Adjustment of speed of pressurisation

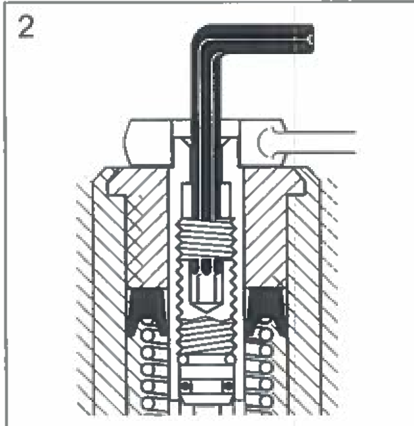
Adjusting the needle to regulate the flow of air allows time T to be the optimum as determined by the air volume to be refilled and the requirements of the installation.



Adjustment requires only basic tools



Secure the piston with a spanner



Adjust the needle using an Allen key whilst holding piston

8. Ordering procedure

Order as preferred model selection to suit installation requirements.

For installations requiring a very rapid vent of components use pilot operated soft start units – details available on application.

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GB-P5005-SS-0791

Non return valves

ANR Series
1/8", 1/4", 1/2" BSP or NPSI

3. Model code

A	N	R	–	* *	*	–	* *	*
				1	2		3	4

1 **Inlet connection**
10 = 1/8" thread
20 = 1/4" thread
40 = 1/2" thread

2 **Type of thread**
G = BSP Parallel
T = NPSI

3 **Supply connection**
10 = 1/8" thread
20 = 1/4" thread
40 = 1/2" thread

4 **Type of thread**
G = BSP Parallel
T = NPSI

1. General description and application benefits

Compact in-line non return valve.

- Free flow in one direction only.
- Protects downstream pressure in event of air system failure.
- Line mounted.

2. Functional symbols

Free flow in from "1" to "2" as indicated by arrow on product.

Preferred model selection

The products listed represent the standard product range most readily available. Models are only available with same size inlet and supply connections.

BSP models

ANR – 10G – 10G	Non return valve 1/8" BSP Parallel
ANR – 20G – 20G	Non return valve 1/4" BSP Parallel
ANR – 40G – 40G	Non return valve 1/2" BSP Parallel

NPSI models

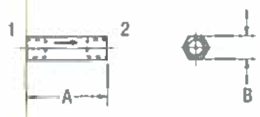
ANR – 10T – 10T	Non return valve 1/8" NPSI
ANR – 20T – 20T	Non return valve 1/4" NPSI
ANR – 40T – 40T	Non return valve 1/2" NPSI

4. Operating Data

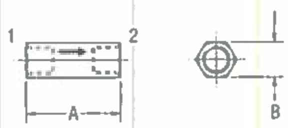
Flow to atmosphere at 6.3 bar (90 psig) body pressure	ANR – 10* – 10* 25.0 dm³/sec (53.0 scfm) ANR – 20* – 20* 33.0 dm³/sec (70.0 scfm) ANR – 40* – 40* 170.0 dm³/sec (360.0 scfm)
Operating pressure	0.2 - 10 bar (2.9 - 145 psig)
Ambient operating temperature range	–20°C to +75°C (–4°F to +167°F)
Type of connection	Screwthread
Port sizes	1/8" - 1/4" - 1/2" BSP or NPSI
Materials of construction	Body - Anodised aluminium alloy Seals - Nitrile
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG37 mineral oil.
Installation dimensions	See below
Mass	ANR – 10* – 10* 0.012 kg (0.03 lb) ANR – 20* – 20* 0.028 kg (0.06 lb) ANR – 40G – 40G 0.082 kg (0.18 lb) ANR – 40T – 40T 0.087 kg (0.19 lb)
Service kits	Replace unit

5. Installation dimensions in mm (inches)

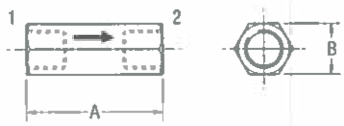
ANR – 10* – 10*



ANR – 20* – 20*



ANR – 40* – 40*



Note
All drawings on this page are reproduced to a scale of 0.25 (copy 4 times at 141% to give full size) – BSP versions.

Model code	A (BSP)	A (NPSI)	B
ANR – 10* – 10*	43 (1.69)	43 (1.69)	13 (0.51)
ANR – 20* – 20*	50 (1.97)	50 (1.97)	19 (0.75)
ANR – 40* – 40*	72 (2.83)	80 (3.15)	27 (1.06)

6. Ordering procedure

Order as preferred model selection to suit installation requirements.

VICKERS

Pneumatics

Shuttle/Tee valves

ATV Series
1/8", 1/4" BSP or NPSI, 1/2" BSP

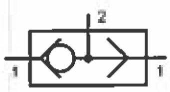
1. General description and application benefits

Free standing shuttle or tee valve to give single pilot output from either of two inputs.

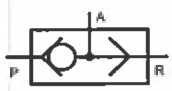
- Lightweight.
- Can be used for an "OR" logic function.
- Simple reliable design.

2. Functional symbols

ATV-10*-10*, ATV-20*-20*



AQE-40G-40G



1 or P/R = inlet
2 or A = outlet

3. Model code

A	* *	–	* *	*	–	* *	*
	1		2	3		4	5

1 Product type
TV = Shuttle/Tee valve
QE = Quick exhaust valve

Note:
1/2" models are standard quick exhaust valves which can be used for the alternative function of a shuttle/tee valve.

2 Inlet connection
10 = 1/8" thread
20 = 1/4" thread
40 = 1/2" thread

3 Type of thread
G = BSP Parallel
T = NPSI

4 Supply connection
10 = 1/8" thread
20 = 1/4" thread
40 = 1/2" thread

5 Type of thread
G = BSP Parallel
T = NPSI

Preferred model selection

The products listed represent the standard product range most readily available. Models are only available with same size inlet and supply connections.

BSP models

Model	Description
ATV – 10G – 10G	Shuttle valve 1/8" BSP Parallel
ATV – 20G – 20G	Shuttle valve 1/4" BSP Parallel
AQE – 40G – 40G	Shuttle valve 1/2" BSP Parallel

NPSI models

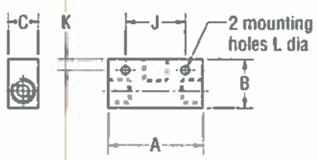
Model	Description
ATV – 10T – 10T	Shuttle valve 1/8" NPSI
ATV – 20T – 20T	Shuttle valve 1/4" NPSI

4. Operating Data

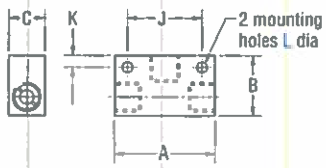
Flow to atmosphere at 6.3 bar (90 psig) body pressure	ATV – 10* – 10* 11.0 dm³/sec (23.3 scfm) ATV – 20* – 20* 25.0 dm³/sec (53.0 scfm) AQE – 40G – 40G 55.0 dm³/sec (116.5 scfm)
Operating pressure	1.0 - 10 bar (14.5 - 145 psig)
Ambient operating temperature range	–20°C to +75°C (–4°F to +167°F)
Type of connection	Screwthread
Port sizes	1/8" - 1/4" BSP or NPSI and 1/2" BSP
Materials of construction	Body - Anodised aluminium alloy Seals - Nitrile
Operating medium	Compressed air, filtered and lubricated or non lubricated. If installed in lubricated system use Shell Tellus 37 or equivalent
Installation dimensions	See below
Mass	ATV – 10* – 10* 0.051 kg (0.11 lb) ATV – 20G – 20G 0.075 kg (0.17 lb) ATV – 20T – 20T 0.105 kg (0.23 lb) AQE – 40G – 40G 0.349 kg (0.77 lb)
Service kits	Replace unit

5. Installation dimensions in mm (inches)

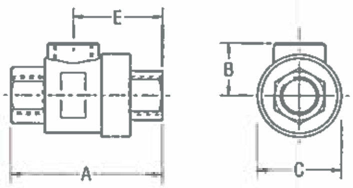
ATV – 10* – 10*



ATV – 20* – 20*



AQE – 40G – 40G



Note
All drawings on this page are reproduced to a scale of 0.25 (copy 4 times at 141% to give full size) – BSP versions.

Model code	BSP	A (BSP)	A (NPSI)	B (BSP)	B (NPSI)	C	E	J	K	L(dia)
ATV – 10* – 10*	G1/8"	50 (1.97)	50 (1.97)	26 (1.00)	26 (1.00)	16 (0.63)		32 (1.26)	6 (0.24)	4.5 (0.18)
ATV – 20* – 20*	G1/4"	52 (2.05)	60 (2.36)	32 (1.25)	38 (1.50)	19 (0.75)		40 (1.57)	6 (0.24)	5.5 (0.22)
AQE – 40G – 40G*	G1/2"	80 (3.15)		30 (1.18)		43 (1.69)	48 (1.89)			

6. Ordering procedure

Order as preferred model selection to suit installation requirements.

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GB-P5005-TV-0495

Quick exhaust valves

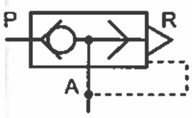
AQE Series
1/8", 1/4", 1/2" BSP

1. General description and application benefits

Free standing valve to provide quick exhausting of air from cylinders.

- Lightweight.
- Simple reliable design.
- Nickel plated brass.
- Compact.

2. Functional symbols



P = Supply
A = Cylinder
R = Exhaust

3. Model code

A Q E	–	* *	*	–	* *	*
		1	2		3	4

1 Inlet connection
10 = 1/8" thread
20 = 1/4" thread
40 = 1/2" thread

2 Type of thread
G = BSP Parallel

3 Supply connection
10 = 1/8" thread
20 = 1/4" thread
40 = 1/2" thread

4 Type of thread
G = BSP Parallel

Preferred model selection

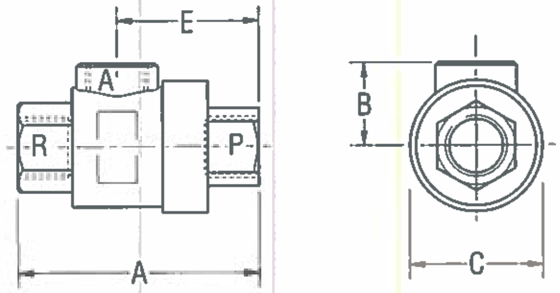
The products listed represent the standard product range most readily available. Models are only available with same size inlet and supply connections.

AQE – 10G – 10G	Quick exhaust valve 1/8" BSP Parallel
AQE – 20G – 20G	Quick exhaust valve 1/4" BSP Parallel
AQE – 40G – 40G	Quick exhaust valve 1/2" BSP Parallel

4. Operating Data

Flow to atmosphere at 6.3 bar (90 psig) body pressure	AQE – 10G – 10G 16.0 dm^3/sec (33.9 scfm) AQE – 20G – 20G 32.0 dm^3/sec (67.8 scfm) AQE – 40G – 40G 85.0 dm^3/sec (180.0 scfm)
Operating pressure	0.2 - 10 bar (2.9 - 145 psig)
Ambient operating temperature range	–20°C to +75°C (–4°F to +167°F)
Type of connection	Screwthread
Port sizes	1/8" - 1/2" BSP
Materials of construction	Body - Nickel plated brass Seals - Nitrile
Operating medium	Compressed air, filtered and lubricated or non lubricated. If installed in lubricated system use ISO VG37 mineral oil.
Installation dimensions	See overleaf
Mass	AQE – 10G – 10G 0.114 kg (0.25 lb) AQE – 20G – 20G 0.179 kg (0.39 lb) AQE – 40G – 40G 0.349 kg (0.77 lb)
Service kits	Replace unit

5. Installation dimensions in mm (inches)



Model code	BSP	A	B	C	E
AQE – 10G – 10G	G1/8"	47 (1.85)	19 (0.75)	29 (1.14)	31 (1.22)
AQE – 20G – 20G	G1/4"	64 (2.52)	24 (0.95)	34 (1.34)	40 (1.57)
AQE – 40G – 40G	G1/2"	80 (3.15)	30 (1.18)	43 (1.69)	48 (1.89)

6. Ordering procedure

Order as preferred model selection to suit installation requirements.

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GB-P5005-QE-0495

Stop valve

STV Series
1/4", 3/8", 1/2", 3/4", 1" BSP

1. General description and application benefits

2 port, 2 position, non-venting ball valve.
Ideal for liquids, gases or air.

- Compact.
- 90^{0} turn.

2. Functional symbol

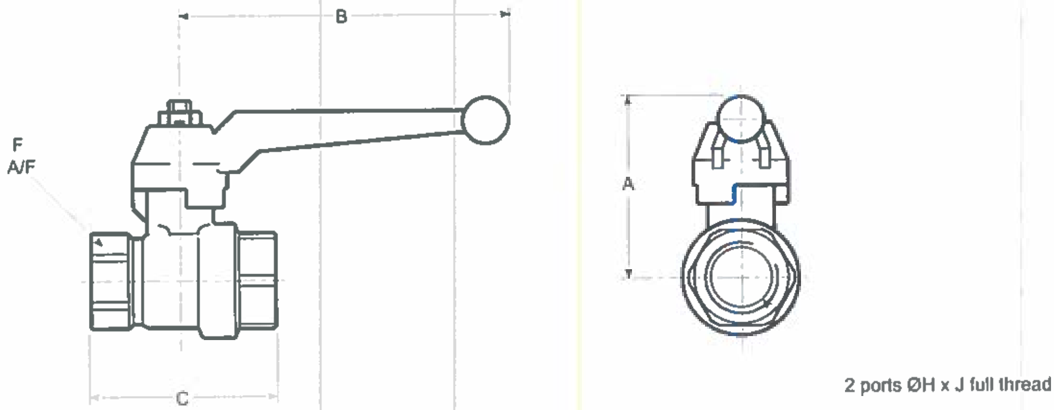
3. Preferred model selection

STV25	2 port, 2 position, non-venting ball valve G1/4"
STV38	2 port, 2 position, non-venting ball valve G3/8"
STV50	2 port, 2 position, non-venting ball valve G1/2"
STV75	2 port, 2 position, non-venting ball valve G3/4"
STV100	2 port, 2 position, non-venting ball valve G1"

4. Operating data

Operating pressure	0 - 10 bar (0 - 145 psig)
Ambient operating temperature range	-10^{0} C to $+100^{0}$ C (15^{0}F to $+212^{0}$ F)
Type of connection	Screwthread
Thread size	1/4", 3/8", 1/2", 3/4", 1" BSP
Materials of construction	Body - Nickel plated brass Ball - Chromium plated Seats - PTFE Handle - Plastic coated aluminium
Operating medium	Compressed air, liquids, gases
Installation dimensions	See overleaf
Mass	STV25 0.18 kg (0.40 lb) STV38 0.19 kg (0.42 lb) STV50 0.33 kg (0.73 lb) STV75 0.48 kg (1.06 lb) STV100 0.84 kg (1.85 lb)
Service kits	Replace unit

5. Installation dimensions in mm



Model code	Bore	A	B	C	F	H	J
STV25	9.5	40	85	39	18	G1/4"	9
STV38	9.5	40	85	39	21	G3/8"	9
STV50	15.0	54	90	50	26	G1/2"	11
STV75	20.0	57	90	58	31	G3/4"	12
STV100	25.0	70	125	67	40	G1"	14

6. Ordering procedure

Order as preferred model selection to suit installation requirements.

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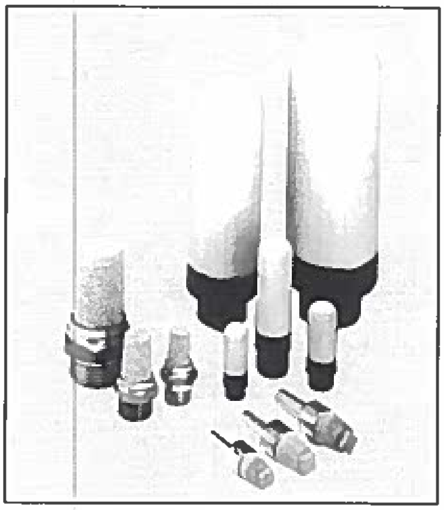
Silencers

PS and PSP Series
M5, 1/8", 1/4", 3/8", 1/2", 3/4", 1" BSP
4mm, 6mm, 8mm, 10mm, 12mm Push-in



1. General description and application benefits

3 ranges of exhaust silencers:-

Sintered bronze series (BSP screwthread)
Brass body with porous bronze silencer chamber (cleanable).

Sintered bronze series (push-in)
Brass body with porous bronze silencer chamber (cleanable).

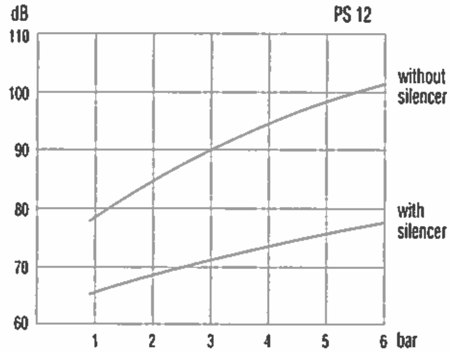
Economy series (BSP screwthread)
Porous high density polyethylene construction of 100 microns pore size. Maintenance free.

- Reduces noise level.
- Push-in or screwthread.
- Sintered bronze units easily cleaned.
- Compact.

2. Noise at work regulations 1989

The Noise at Work Regulations1989 act which came into force in January 1990 places an obligation on both employer and employee to minimise the risk of damage to hearing at the workplace. By fitting Vickers silencer units this will help to reduce the noise of exhaust air from pneumatic equipment to an acceptable level below 85dB (A).

Exhaust noise of a 1/2" 5/2 valve controlling an air cylinder of bore size 80mm



3. Functional symbol

4. Preferred model selection and mass

The products listed represent the standard product range most readily available.

Sintered bronze series (BSP screwthread)

Model code	Description	Mass
PS18	Screw-in silencer G1/8"	0.017kg
PS14	Screw-in silencer G1/4"	0.025kg
PS38	Screw-in silencer G3/8"	0.037kg
PS12	Screw-in silencer G1/2"	0.064kg
PS34	Screw-in silencer G3/4"	0.137kg
PS11	Screw-in silencer G1"	0.193kg

Sintered bronze series (push-in)

Model code	Description	Mass
PS04P	Push-in silencer 4mm	0.011kg
PS06P	Push-in silencer 6mm	0.025kg
PS08P	Push-in silencer 8mm	0.026kg
PS10P	Push-in silencer 10mm	0.032kg
PS12P	Push-in silencer 12mm	0.046kg

Economy series (BSP screwthread)

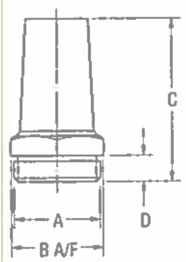
Model code	Description	Mass
PSPM5	Screw-in silencer M5	0.0004kg
PSP13	Screw-in silencer G1/8"	0.0018kg
PSP25	Screw-in silencer G1/4"	0.0029kg
PSP38	Screw-in silencer G3/8"	0.0066kg
PSP50	Screw-in silencer G1/2"	0.0110kg
PSP75	Screw-in silencer G3/4"	0.0424kg
PSP100	Screw-in silencer G1"	0.0669kg

5. Operating Data

Operating pressure	0 – 10 bar (0 – 145 psig)
Ambient operating temperature range	–20°C to +80°C (–4°F to +176°F)
Type of connection	Push-in or screwthread
Port sizes	M5 – 1" BSP
Materials of construction	Body – Brass or high density polyethylene Silencer chamber – Porous bronze or porous high density polyethylene
Installation dimensions	See below
Mass	See under preferred model selection on page AS 1.1
Service kits	Replace unit

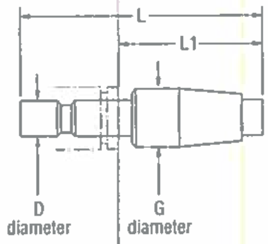
6. Installation dimensions in mm (inches)

PS**



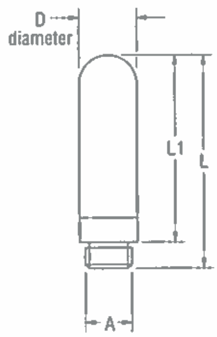
Model	A	B	C	D
PS18	G1/8"	14.0	28.0	7.0
PS14	G1/4"	16.5	28.3	7.1
PS38	G3/8"	18.2	34.0	7.9
PS12	G1/2"	23.3	39.0	7.9
PS34	G3/4"	30.5	56.4	12.7
PS11	G1"	37.6	67.2	12.7

PSP**



Model	D	G	L	L1
PS04P	4	13	43.5	28.5
PS06P	6	15	50	33.5
PS08P	8	15	51	34
PS10P	10	19.5	67	45.5
PS12P	12	20	68	45

PSP***



Model	A	D	L	L1
PSPM5	M5	6.5	23	19.5
PSP13	G1/8"	12.5	35	29.5
PSP25	G1/4"	15	44	37
PSP38	G3/8"	18	66	55
PSP50	G1/2"	23	79	68
PSP75	G3/4"	38	124	107
PSP100	G1"	49	156	136

7. Ordering procedure

Order as preferred model selection to suit installation requirements.

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GB-P5005-S-0495

VICKERS

Pressure Switch

PS013 Series
1/8" BSP

1. General description and application benefits

Pressure switches are used for monitoring system pressures to sound an alarm, operate a warning light, or cut off the electrical supply to a pump or machine as soon as the pressure gets above or below the optimum level. PS013 pressure switches are particularly suitable for use on compressed air systems, or to monitor water pressures or provide cut-out on pressure failure in lubrication systems. They can be used on all non-corrosive fluids except for those with high viscosity.

- Small and compact.
- Factory set or field adjustment.
- Spring diaphragm.
- Ranges from 3 to 8 bar.
- Rated at 5 amps at 250v AC.
- Burst pressure 100 bar.

2. Functional symbol

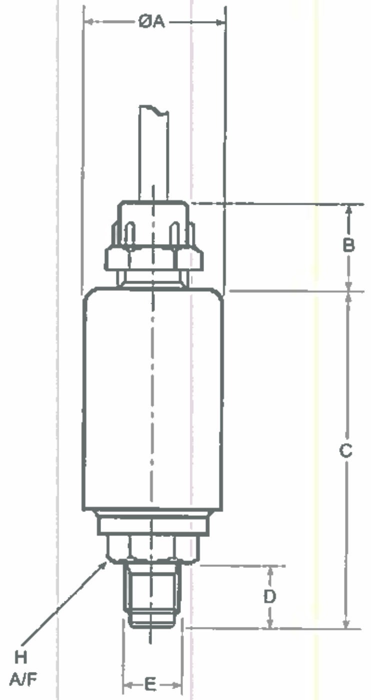
3. Preferred model selection

PS013-8	8 bar pressure switch with 3 metre flying lead (standard)
PS013-5	5 bar pressure switch with 3 metre flying lead (optional)
PS013-3	3 bar pressure switch with 3 metre flying lead (optional)

4. Operating data

Operating pressure	PS013-8 1.0 - 8 bar (14.5 - 116psig) PS013-5 0.5 - 5 bar (7.3 - 72.5 psig) PS013-3 0.3 - 3 bar (4.3 - 43.5 psig)
Maximum pressure	Cyclic applications - 75% of range Static applications - Full range
Setting pressure	All switches are adjustable and are supplied set at mid range
Pressure differential	PS013-8 0.75 bar (10.9 psig) PS013-5 0.27 bar (4.0 psig) PS013-3 0.15 bar (2.2 psig)
Ambient operating temperature range	-10° C to + 80° C (14°F to + 176° F)
Type of connection	Screwthread
Thread size	1/8" BSP
Materials of construction	Case - Delrin Diaphragm - Beryllium copper Seals - Nitrile
Operating medium	Vacuum, compressed air, water oil, non-corrosive fluids
Type of electrical connection	3 metre 3 core flying lead Brown-Common, Black-Normally open Blue-Normally closed
Contact rating	5 amps at 250v AC For use on DC circuits or with electronic control equipment consult Customer Services Department
Microswitch	Single pole, single throw microswitch. Can be wired normally open or normally closed.
Corrosive applications	The threaded connection can be 316 stainless steel or UPVC. The diaphragm can be protected from corrosion by fitting a thin disc of PTFE (Such switches should not be used on vacuum applications). PTFE, Viton or EPDM seals available as option. For additional details consult Customer Services Department.
Installation dimensions	See overleaf
Mass	PS013-* 0.100kg (0.22lb)
Service kits	Replace unit

5. Installation dimensions in mm (inches)



Model code	A	B	C	D	E	H
PS013-*	28 (1.10)	16 (0.63)	60 (2.36)	11 (0.43)	G1/8"	14 (0.55)

6. Ordering procedure

Order as preferred model selection to suit installation requirements.

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

Printed in Great Britain

GB-P5005-PS013-0393

Pressure switch

PS025 Series
1/4" BSP

1. General description and application benefits

Diaphragm operated pressure switch with single pole, single throw microswitch.
Set pressure adjustment facilitated by removal of cover and rotating adjusting nut.
Can be mounted in any position, but should be isolated from severe vibration particularly along the axis of the pneumatic connection.
Differential version available - For further details contact Customer Services Department.

- Reliability in operation.
- Normally open or normally closed.
- Mounted in any position.
- Wall mounting bracket (SF1758) supplied as standard.

2. Functional symbol

3. Preferred model selection

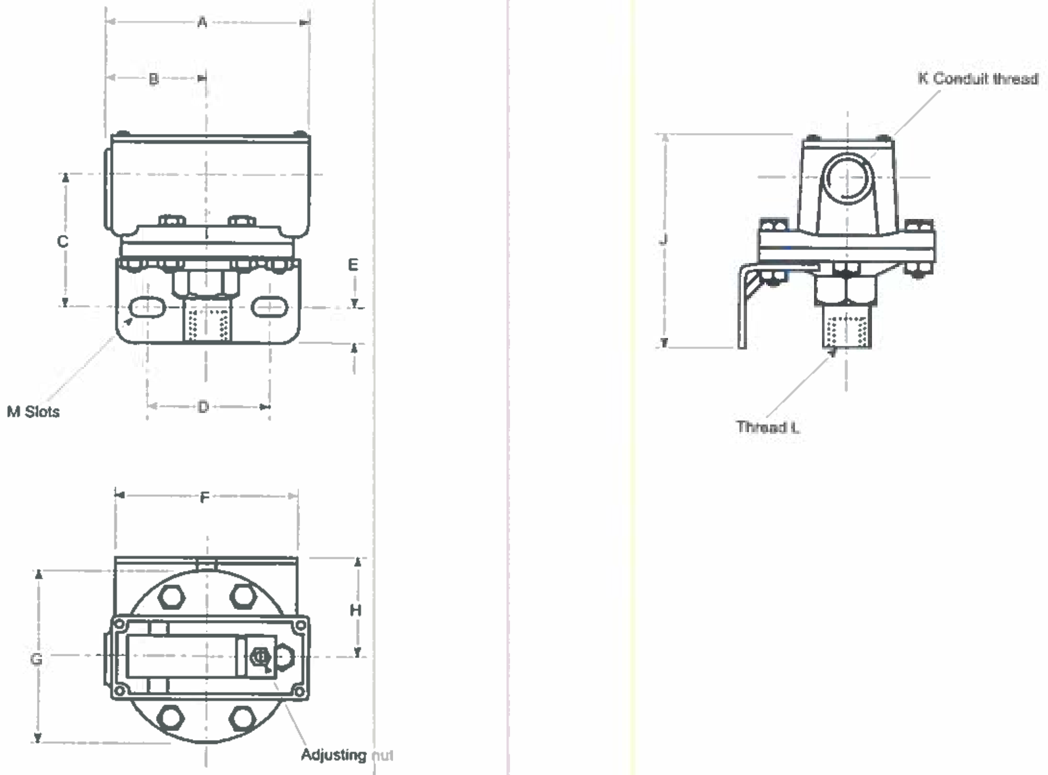
The products listed represent the standard product range most readily available.

PS025	Pressure switch 1/4" BSP Taper
PS025V	Differential pressure switch 1/4" BSP Taper

4. Operating data

Operating pressure	0.3 - 10 bar (4.3 - 145 psig)
Maximum pressure	11 bar (156 psig). Switches are tested to 25% above maximum pressure
Setting pressure	Variable 0.3 to 10 bar (4.3 to 145 psig). Switches are supplied set at 5.5 bar (80 psig) on rising pressure
Accuracy of setting	+/- 1% of set pressure
Repeatability of setting	+/- 0.25% of set pressure
Reset differential (typical)	0.3 bar (4.3 psig)
Ambient operating temperature range	-20^{0}C to + 80^{0}C (-4^{0}F to + 176^0 F)
Type of connection	Screwthread
Port size	1/4" BSP
Materials of construction	Base - Brass Case - Cast aluminium Diaphragm - Beryllium copper
Operating medium	Compressed air, filtered and lubricated or non lubricated. If installed in lubricated system use ISO VG 37 mineral oil. Water or neutral liquids and gases.
Type of electrical connection	Screw tag terminals
Conduit entry	M20 x 1.5 screwthread to BS4568
Electrical rating	5 amps at 250v AC - Inductive 0.5 amps at 250v AC - Tungsten lamp 15 amps at 12v DC - Resistive 8 amps at 12v DC - Inductive For additional loading details consult Customer Services Department.
Microswitch	Single pole, single throw microswitch. Can be wired normally open or normally closed.
Reliability	Microswitch: 10^7 operations Diaphragm: 5 x 10^6 operations
Installation dimensions	See overleaf
Mass	PS025 0.750kg (1.65lb) PS025V 0.750kg (1.65lb)
Service kits	Pressure switch - Replace unit Mounting bracket - SF1758

5. Installation dimensions in mm (inches)



Model code	A	B	C	D	E	F	G
PS025	92 (3.62)	48 (1.89)	56.5 (2.22)	51 (2.00)	16 (0.63)	76 (2.99)	77 (3.03)
PS025V	92 (3.62)	48 (1.89)	56.5 (2.22)	51 (2.00)	16 (0.63)	76 (2.99)	77 (3.03)

Model code	H	J	K	L	M
PS025	42 (1.65)	90 (3.54)	M20 x 1.5	G1/4"	6.5 x 12.5 (0.26 x 0.50)
PS025V	42 (1.65)	90 (3.54)	M20 x 1.5	G1/4"	6.5 x 12.5 (0.26 x 0.50)

6. Ordering procedure

Order as preferred model selection to suit installation requirements.

Model PS025V (Differential pressure switch) available to special order.

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

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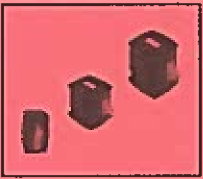
Pegasus AIR TREATMENT and CONTROL

Safety shut off / exhaust valves

		Series	Port size	Maximum flow	Options	Page numbers
Modular 08 series 18 series 28 series		LV08 LV18 LV28	G1/8"-1/4" G1/4"-1/2" G3/8"-3/4"	47.2 dm³/sec 107.0 dm³/sec 143.0 dm³/sec		E 1.1 E 2.1 E 3.1

Particle filters

		Series	Port size	Maximum flow	Options	Page numbers
Modular 08 series 18 series 28 series 8000 series		LF08 LF18 LF28 F8000	G1/8"-1/4" G1/4"-1/2" G3/8"-3/4" G3/4"-1"	23.6 dm³/sec 57.0 dm³/sec 79.2 dm³/sec 153.0 dm³/sec	Plastic bowls Metal bowls Manual drains Auto drains	F 1.1&1.2 F 2.1&2.2 F 3.1&3.2 F 4.1&4.2

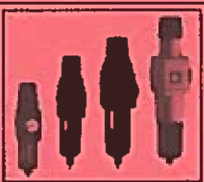
Coalescing filters

		Series	Port size	Maximum flow	Options	Page numbers
Modular 08 series 18 series 28 series 8000 series		LM08 LM18 LM28 M8000	G1/4" G1/4"-1/2" G3/8"-3/4" G3/4"-1"	7.3 dm³/sec 32.0 dm³/sec 64.1 dm³/sec 30.0 dm³/sec	Plastic bowls Metal bowls Manual drains Auto drains Filter elements	M 1.1&1.2 M 2.1&2.2 M 3.1&3.2 M 4.1&4.2

Regulators

		Series	Port size	Maximum flow	Options	Page numbers
Modular 08 series 18 series 28 series 8000 series		LR08 LR18 LR28 R8000	G1/8"-1/4" G1/4"-1/2" G3/8"-3/4" G3/4"-1"	18.9 dm³/sec 60.0 dm³/sec 75.5 dm³/sec 232.0 dm³/sec	Self relieving Non relieving High pressure spring Low pressure spring	R 1.1&1.2 R 2.1&2.2 R 3.1&3.2 R 4.1&4.2

Filter / Regulator combination units

		Series	Port size	Maximum flow	Options	Page numbers
Modular 08 series 18 series 28 series 8000 series		LB08 LB18 LB28 W8000	G1/8"-1/4" G1/4"-1/2" G3/8"-3/4" G3/4"-1"	19.9 dm³/sec 58.9 dm³/sec 78.0 dm³/sec 164.0 dm³/sec	See relevant filter and regulator for details	B 1.1&1.2 B 2.1&2.2 B 3.1&3.2 B 4.1&4.2

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Pegasus AIR TREATMENT and CONTROL

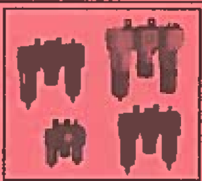
Lubricators

Modular	Series	Port size	Maximum flow	Options	Page numbers
08 series	LL08	G1/8"-1/4"	27.1 dm³/sec	Plastic bowls	L 1.1&1.2
18 series	LL18	G1/4"-1/2"	45.3 dm³/sec	Metal bowls	L 2.1&2.2
28 series	LL28	G3/8"-3/4"	94.3 dm³/sec		L 3.1&3.2
8000 series	L8000	G3/4"-1"	207.0 dm³/sec		L 4.1&4.2

Filter/Regulator, Lubricator combination units

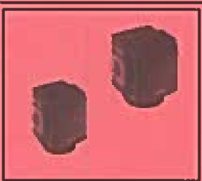
Modular	Series	Port size	Maximum flow	Options	Page numbers
08 series	LD08	G1/8"-1/4"	18.0 dm³/sec	See relevant filter/regulator and lubricator for details	D 1.1&1.2
18 series	LD18	G1/4"-1/2"	58.9 dm³/sec		D 2.1&2.2
28 series	LD28	G3/8"-3/4"	75.5 dm³/sec		D 3.1&3.2
8000 series	C8010	G3/4"-1"	142.0 dm³/sec		D 4.1&4.2

Filter, Regulator, Lubricator combination units



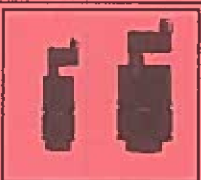
Modular	Series	Port size	Maximum flow	Options	Page numbers
08 series	LC08	G1/4"	18.9 dm³/sec	See relevant filter, regulator and lubricator for details	C 1.1&1.2
18 series	LC18	G1/4"-1/2"	58.9 dm³/sec		C 2.1&2.2
28 series	LC28	G3/8"-3/4"	75.5 dm³/sec		C 3.1&3.2
8000 series	C8000	G3/4"-1"	142.0 dm³/sec		C 4.1&4.2

Slow start valves



Modular	Series	Port size	Maximum flow	Options	Page numbers
18 series	LS18	G1/4"-1/2"	53.3 dm³/sec	Air operated	SS 2.1, SS 2.2
28 series	LS28	G3/8"-3/4"	105.0 dm³/sec	Solenoid operated	SS 3.1, SS 3.2

Emergency stop valves with slow start



Modular	Series	Port size	Maximum flow	Options	Page numbers
18 series	LE18	G1/4"-1/2"	53.3 dm³/sec		ES 2.1, ES 2.2
28 series	LE28	G3/8"-3/4"	108.5 dm³/sec		ES 3.1, ES 3.2

Pegasus AIR TREATMENT and CONTROL

Instrumentation products		Series	Port size	Maximum flow	Options	Page numbers
Modular electronic regulator		**LER1** **LER2**	**G1/4"-1/2"** **G3/4"**	**94.3 dm³/sec** **94.3 dm³/sec**	**Voltage control** **Current control** **Internal resistor** **Bar or psig readout**	**ER 2.1** **ER 2.2** **ER 3.1** **ER 3.2**

Associated products		Series	Port size	Maximum flow	Options	Page numbers
Pressure switch		**PS013**	**G1/8"**		**Pressure range**	**PS08 1.1**
Exhaust cleaner		**FA**	**G3/8"** **G1/2"** **G3/4"** **G1"** **G1½"** **G2"**	**300 Nl/min** **600 Nl/min** **1000 Nl/min** **3000 Nl/min** **6000 Nl/min** **10000 Nl/min**	**Mounting bracket**	**FA 1.1** **FA 1.2**
Muffler Reclassifier		**F23** **F33**	**G1/2"** **G3/4"** **G1"**	**80 dm³/sec** **135 dm³/sec**	**Metal bowl with sight gauge** **Mounting bracket**	**MR 1.1**
Automatic drains		**X02** **X01**	**G1/2"**	**300 l/hr** **570 l/hr**	**Heavy duty mechanical drain**	**X 1.1**

SECTION 7

APPROVED TO BS EN ISO 9001 QUALITY STANDARD

Pegasus AIR TREATMENT and CONTROL

Accessories

	Product	Page numbers
08 Series	T Bracket, L Bracket, C Bracket Joiner set Piping adaptor set, Piping adaptor set with T bracket Distributor block, Distributor block with check valve Flush mounted gauge	MA 1.1 (08 series section)
18 Series	T Bracket, L Bracket, C Bracket Joiner set, Joiner set with T bracket End block Distributor block, Distributor block with check valve Centre back mounted gauge	MA 2.1 (18 series section)
28 Series	T Bracket, L Bracket, C Bracket Joiner set, Joiner set with T bracket End block Distributor block, Distributor block with check valve Centre back mounted gauge	MA 3.1 (28 series section)
8000 Series	T Bracket, C Bracket Joiner set Piping adaptor set, Piping adaptor set with T bracket L shaped piping adaptor set L shaped piping adaptor set with T bracket Distributor block, Distributor block with T bracket Flush mounted gauge	MA 4.1 (8000 series section)
Gauges	Flush mounted (for 08 and 8000 series only) Centre back mounted Panel mounted	PG.1 (Associated products section)

VICKERS

Pneumatics

CKD direct acting poppet valves for air and vacuum Series 3PA2 and 3PB2

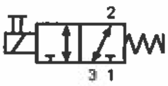
1/8", 1/4"BSP
3/2

1. General description and application benefits

A range of high flow, compact, direct acting, 3 port, 2 position poppet valves, direct or sub base ported.
Low power solenoid operated.
For air or vacuum applications.

- High flow.
- Compact size - only 22mm wide.
- Suitable for air or vacuum.
- Lube free.
- Lamp and surge protection.
- Low power - 1.8W.
- Pre wired solenoid leads as standard.
- Normally open or normally closed operation.
- Wide pressure range 10 Torr to 7bar.
- Poppet type valve ensures excellent sealing.

2. Functional symbol



Normally closed - Inlet port 1 (P)
Normally open - Inlet port 3 (R)

3. Model code

3 P * 2 1 0 - * * - * * - * *
[1] [2] [3] [4]

[1] Model
A = Direct ported
B = Sub base ported

[2] Port sizes
06G = G1/8"
08G = G1/4"

[3] Electrical connection
C2 = C type plug in connector with surge killer and lamp. 300mm long lead wire

[4] Voltage code
KZ = 24v DC
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC

Preferred model selection

3PA210-06G-C2-**	3 port, 2 position,solenoid operated, spring return, body ported (G1/8")
3PB210-06G-C2-**	3 port, 2 position,solenoid operated, spring return, sub base ported (G1/8")
3PB210-08G-C2-**	3 port, 2 position,solenoid operated, spring return, sub base ported (G1/4")

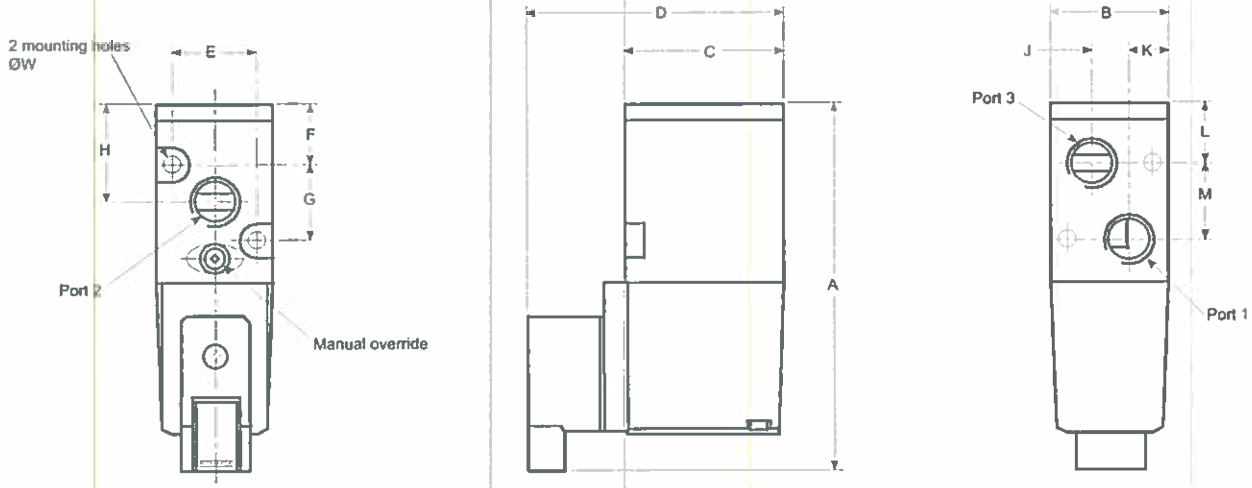
*** = Solenoid voltage code - to be specified (see position [4] above)*

4. Operating data

Flow factors to ISO6358 (BS7294)	Kv = 4.0 Cv = 0.28
Flow to atmosphere	4.66 dm3/sec (9.90 scfm)
Maximum operating pressure	7 bar (100psig)
Minimum operating pressure	-750mm Hg
Ambient operating temperature range	5°C to 50°C (41°F to 122°F)
Response times at 6.3bar (90psig)	20msec or less
Type of connection and port sizes	3PA2 - G1/8" body ported 3PB2 - G1/8" or G1/4"sub base ported
Materials of construction	Body - Aluminium alloy Plunger and springs - Stainless steel O rings - NBR Gasket - Nitrile
Operating medium	Vacuum to 10 Torr. Compressed air, filtered non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Installation dimensions	See pages 3PA 2.2
Mass	3PA210-06-C2-** 127g 3PB210-**-C2-** 175g
Solenoid coils	Class B moulded coil. Nominal voltages - See position [4] of model code above Voltage tolerance +10% to -10% Coil consumption at nominal voltage and 20°C (68°F) ambient - 1.8W Holding current - 110/120v AC - 0.028A 220/240v AC - 0.014A 24v DC - 0.075A Inrush current - 110/120v AC - 0.046A 220/240v AC - 0.023A Surge protection and indicator lamp standard 300mm flying lead standard
Service kits	Replace unit

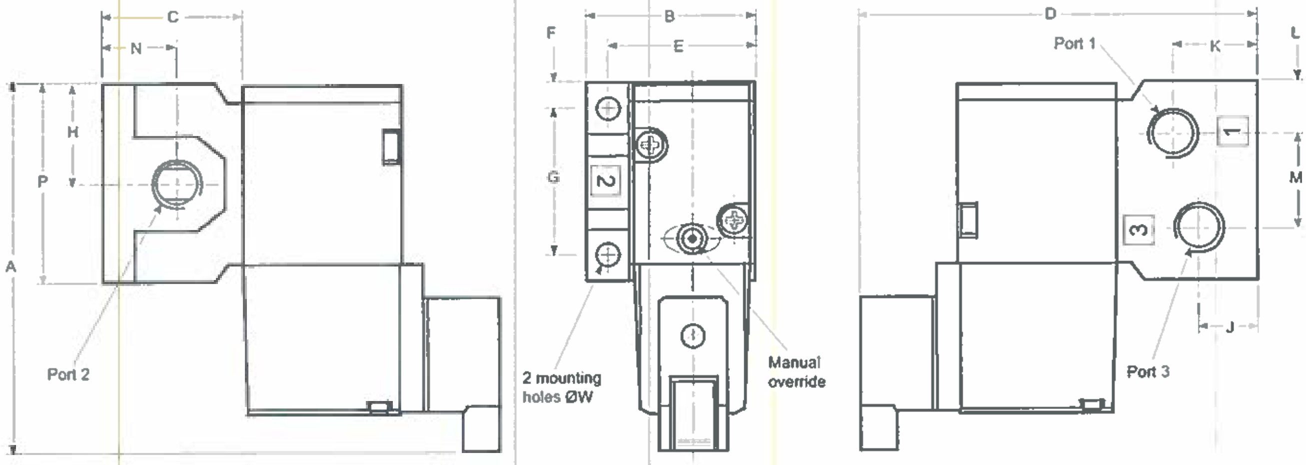
5. Installation dimensions in mm

3PA210 - 06G - C2 - **



Port 1	Port 2	Port 3	A	B	C	D	E	F	G	H	J	K	L	M	W
G1/8"	G1/8"	G1/8"	70	22	30	48.5	16	11.5	14.5	18.5	7	7.5	11.5	14.5	3.3

3PB210 - 06G - C2 - **, 3PB210 - 08G - C2 **



Model number	Port 1	Port 2	Port 3	A	B	C	D	E	F	G	H	J	K	L	M	N	P	W
3PB210 - 06G - C2 - **	G1/8"	G1/8"	G1/8"	70	32	26	75	28	5	28	19	11	16	10	18	14	38	4.5
3PB210 - 08G - C2 - **	G1/4"	G1/4"	G1/4"	70	32	26	75	28	5	28	19	11	16	10	18	14	38	4.5

Note: All drawings on this page are reproduced to a scale of 70% (Copy at 141% to give full size)

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VICKERS

Pneumatics

High flow poppet valves Series VP25 and VP50

1/4" and 1/2"BSP 2/2 and 3/2

1. General description and application benefits

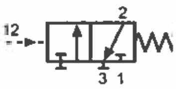
High flow poppet valves, in-line ports, closed centre, for 2 or 3 way function. Available in air or solenoid operated versions, spring return.
Suitable for normally-open or normally-closed function and for use with dry or lubricated air.

- High flow.
- 2 or 3 way function.
- Lube free.
- Normally-open or normally-closed.

2. Functional symbols

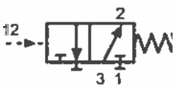
2 way

VP25-15, VP50-15



2 port, 2 position
Normally closed
Air actuated
Spring return

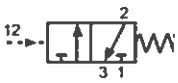
VP25-15NO, VP50-15NO



2 port, 2 position
Normally open
Air actuated
Spring return

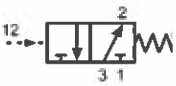
3 way

VP25-15, VP50-15



3 port, 2 position
Normally closed
Air actuated
Spring return

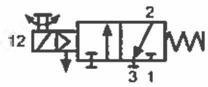
VP25-15NO, VP50-15NO



3 port, 2 position
Normally open
Air actuated
Spring return

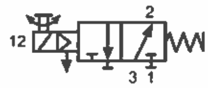
2 way

VP25-51, VP50-51****



2 port,2 position
Normally closed
Solenoid pilot actuated
Spring return

VP25-51NO, VP50-51NO****



2 port,2 position
Normally open
Solenoid pilot actuated
Spring return

3 way

VP25-51, VP50-51****

3 port,2 position
Normally closed
Solenoid pilot actuated
Spring return

VP25-51NO, VP50-51NO****

3 port,2 position
Normally open
Solenoid pilot actuated
Spring return

3. Model code

V P	*	*	-	*	*	*	*	*	*
	1			2		3		4	

1 Port size
25 = G1/4"
50 = G1/2"

2 Version code
15 = 2 position, air actuated, spring return.
51 = 2 position, solenoid pilot actuated, spring return.

Note: Solenoid operated valves are fitted with manual override facility which is lever and/or screwdriver actuated and can be removed to delete this facility if not required.

3 Function
No mark = Normally closed
NO = Normally open

4 Voltage code
JZ = 12v DC
KZ = 24v DC
MZ = 48v DC
KY = 24v 50/60Hz AC
MY = 48v 50/60Hz AC
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC

Preferred model selection

Model	Description
VP25-15	G1/4", 3 port, 2 position, normally closed, air actuated, spring return.
VP25-15NO	G1/4", 3 port, 2 position, normally open, air actuated, spring return.
VP25-51**	G1/4", 3 port, 2 position, normally closed, solenoid pilot operated, spring return.
VP25-51NO**	G1/4", 3 port, 2 position, normally open, solenoid pilot operated, spring return.
VP50-15	G1/2", 3 port, 2 position, normally closed, air actuated, spring return.
VP50-15NO	G1/2", 3 port, 2 position, normally open, air actuated, spring return.
VP50-51**	G1/2", 3 port, 2 position, normally closed, solenoid pilot operated, spring return.
VP50-51NO**	G1/2", 3 port, 2 position, normally open, solenoid pilot operated, spring return.

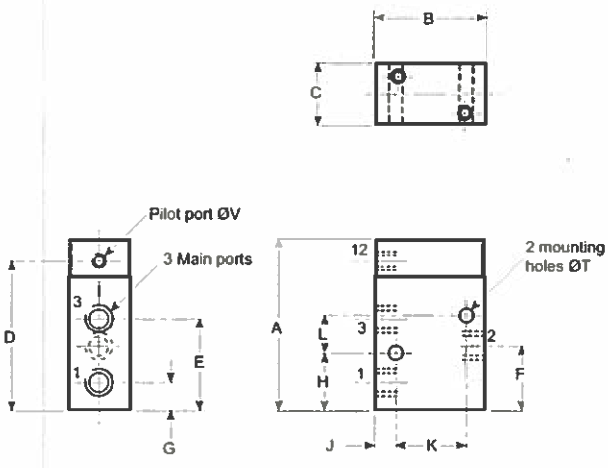
*** = Solenoid voltage code - to be specified (see position 4 above)*

4. Operating data

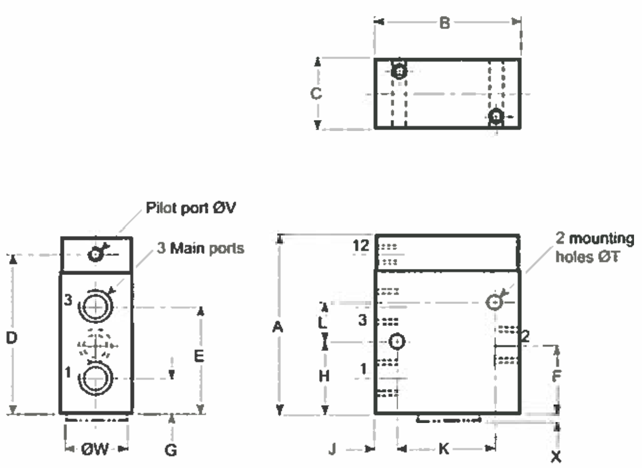
Flow factors to ISO 6358 (BS 7294)	Kv = VP25 - 27, VP50 - 48 Cv = VP25 - 1.75, VP50 - 3.15
Flow to atmosphere at 6.3 bar (90psig) body pressure	VP25 - 46dm3/sec (98scfm) VP50 - 83dm^3/sec (176scfm)
Minimum pilot air pressure at 6.3bar (90psig) body pressure	All types, normally closed - 1.7bar (24.7psig) All types, normally open - equal to body pressure
Operating pressure	Normally closed - 0.5 to 10 bar (7.2 to 145 psig) Normally open - 0.5 to 6.3 bar (7.2 to 90 psig)
Ambient operating temperature range	Air operated, -10°C to + 75°C (14°F to 167°F) Solenoid operated, -10°C to + 50°C (14°F to 123°F)
Response times at 6.3bar (90psig)	VP25 ON - 30 milliseconds OFF - 5 milliseconds VP50 ON - 40 milliseconds OFF - 10 milliseconds
Cycling rate	600 cyles per minute at 20°C (68°F) ambient
Type of connection and port sizes	VP25 - 1/4"BSP main ports, 1/8"BSP pilot port VP50 - 1/2"BSP main ports, 1/8"BSP pilot port
Materials of construction	Body and end cover- Epoxy painted aluminium alloy Poppet and cartridge - Acetal Spindle and springs - Stainless steel Seals - Nitrile
Operating medium	Compressed air, filtered and lubricated or non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Installation dimensions	See page VP 1.3
Mass	VP25-15, VP25-15NO - 0.4kg VP25-51**, VP25-51NO** - 0.5kg VP50-15, VP50-15NO - 0.62kg VP50-51**, VP50-51NO** - 0.74kg
Feeder bars	For details see page VP 1.4
Solenoid coils	Fully encapsulated and tropicalised. Class F insulation 155°C (310°F) Protection class IP65 when fitted with 3 pin socket connection to DIN43650 Type B Ambient temperature -10°C to +50°C (15°F to 123°F) Nominal voltages - See position 4 of model code (page VP 1.2) Voltage tolerance +10% to -10% Coil consumption at nominal voltage and 20°C (68°F) ambient DC coils - 5W maximum, AC coils - 5VA holding, 8VA nominal inrush
Service kits	VP25 - KV135, VP25/NO - KV137 VP50 - KV136 VP50/NO - KV138 Solenoid coil - VEM13-141**, Solenoid operator assembly - VEM16D-MO-SA

5. Installation dimensions in mm

VP25-15, VP25-15NO



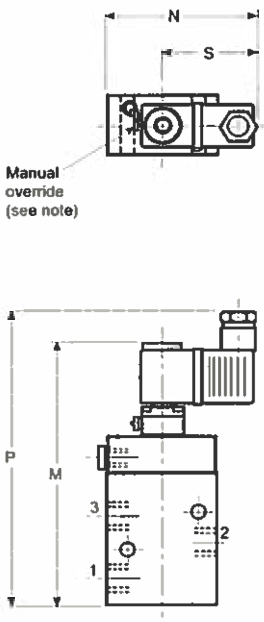
VP50-15, VP50-15NO



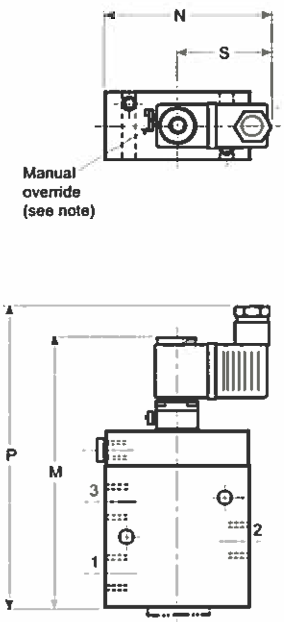
For 2 way operation - Blanking plug should be fitted:- To port 3 for normally-closed operation
To port 1 for normally-open operation

Model code	Port size	A	B	C	D	E	F	G	H	J	K	L	T	V	W	X
VP25-15	G1/4"	91	57	32	79.5	48	34.5	14.5	31	6.5	44	20	7.1	G1/8"	-	-
VP25-15NO	G1/4"	91	57	32	79.5	48	34.5	14.5	31	6.5	44	20	7.1	G1/8"	-	-
VP50-15	G1/2"	96	76	38	84.5	53	33.5	15	35	13	50	20	7.1	G1/8"	-	-
VP50-15NO	G1/2"	96	76	38	84.5	53	33.5	15	35	13	50	20	7.1	G1/8"	26	4

VP25-51, VP25-51NO



VP50-51, VP50-51NO



For 2 way operation - Blanking plug should be fitted:- To port 3 for normally-closed operation
To port 1 for normally-open operation

Model code	Port size	M	N	P	S
VP25-51**	G1/4"	139	78.5	155	50
VP25-51NO**	G1/4"	139	78.5	155	50
VP50-51**	G1/2"	144	88	160	50
VP50-51NO**	G1/2"	144	88	160	50

Note: *Manual override operator is lever and/or screwdriver actuated and can be removed to delete this facility if not required.*

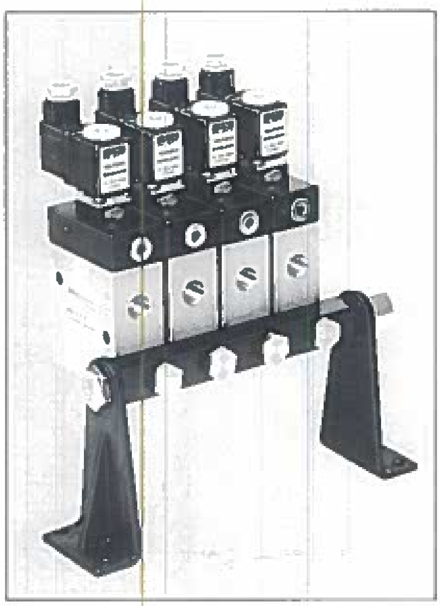
Internal to external pilot adaption
Normally-open and normally-closed valves can be adapted from internal pilot to external pilot by fitting nitrile rubber disc - order separately - Part Number SF2392.
For installation details see instruction sheet supplied in disc package.(Ref No SF2392)

VICKERS

Pneumatics

High flow poppet valves Series VP25

Feeder bar assemblies 3/8"BSP



1. General description and application benefits

A range of feeder bar assemblies for use with Series VP25 valves (only).

Available for arrangements from 2 to 6 valves and having 3/8"BSP inlet connection.

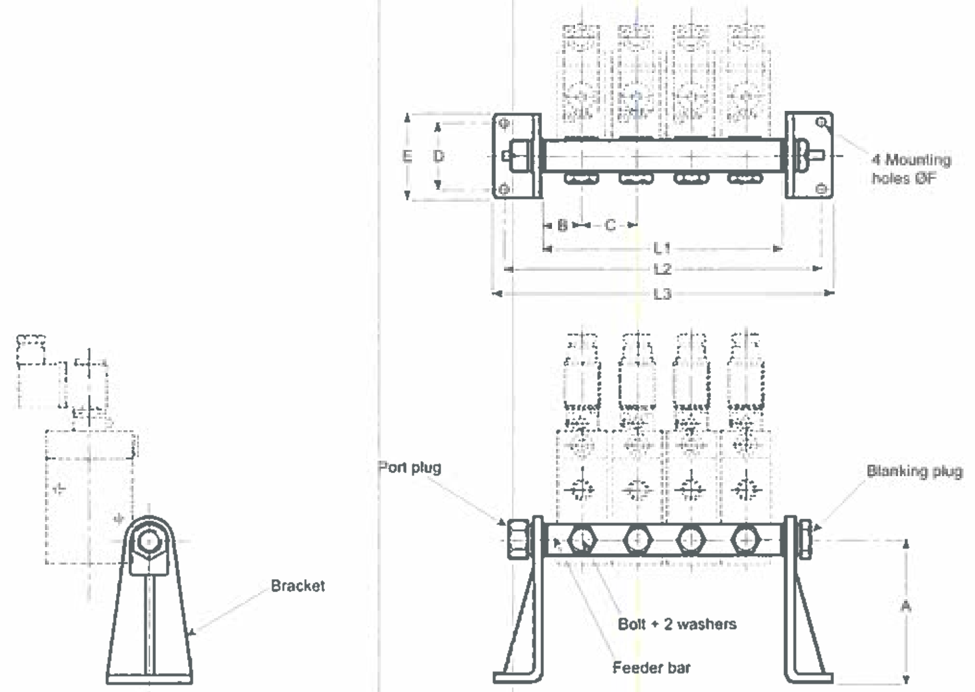
Feeder bars can be supplied as bar only plus required number of banjo bolts and washers or complete with mounting brackets, blanking plug and port plug.

- Compact assembly for panel installations.
- Cost effective assembly.

2. Model code

449052	2 station feeder bar including banjo bolts and washers
449053	3 station feeder bar including banjo bolts and washers
449054	4 station feeder bar including banjo bolts and washers
449055	5 station feeder bar including banjo bolts and washers
449056	6 station feeder bar including banjo bolts and washers
449050	Pair of mounting brackets
449090	G3/8" Blanking plug including 2 off washers
449091	G3/8" Port plug including 2 off washers

4. Installation dimensions in mm



Number of stations	A	B	C	D	E	F	L1	L2	L3
2	95	25	36	44	56	7	86	128	148
3	95	25	36	44	56	7	122	164	184
4	95	25	36	44	56	7	158	200	220
5	95	25	36	44	56	7	194	236	256
6	95	25	36	44	56	7	230	272	292

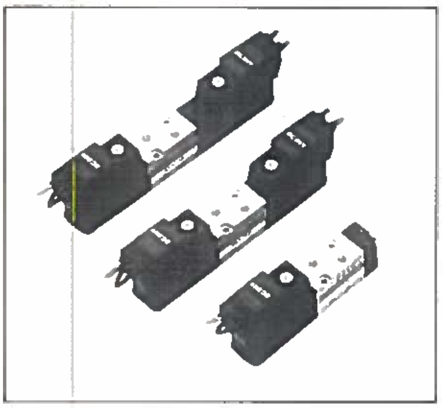
Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

Printed in Great Britain

GB-P5015-VP-0893

CKD picosol spool valves
Series 4SAO - Body ported

4mm barb tube fitting, M3 - 5/2 and 5/3
2.5, 4, 6, 8, 10, 12, 16, 20, 25mm



1. General description and application benefits

A range of high performance, miniature, pilot solenoid operated spool valves. Available in 5 port, 2 position or 5 port, 3 position body ported versions.

- High flow.
- Miniature size - only 10mm wide.
- Lube free.
- Lamp and surge protection as standard.
- Low power - 1W.
- Manual override as standard.
- Pre wired solenoid leads as standard.

2. Functional symbols

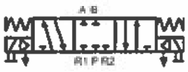
4SAO10--C2-****

5 port, 2 position. Solenoid pilot actuated. Internal pilot air return.

4SAO20--C2-****

5 port, 2 position. Solenoid pilot actuated at both ends.

4SAO30--C2-****



5 port, 3 position. Spring centred. Solenoid pilot actuated at both ends. Pressure held neutral.

4SAO40--C2-****

5 port, 3 position. Spring centred. Solenoid pilot actuated at both ends. Pressure release neutral.

4SAO50--C2-****

5 port, 3 position. Spring centred. solenoid pilot actuated at both ends. Pressure applied neutral.

For additional model types request catalogue CC-N-287A.

3. Model code

4SAO * 0 - ** - ** - **
[1] [2] [3] [4]

[1] Position / operator
1 = 2 position single solenoid.
2 = 2 position double solenoid.
3 = 3 position double solenoid, pressure held neutral.
4 = 3 position double solenoid, pressure release neutral.
5 = 3 position double solenoid, pressure applied neutral.

[2] Port sizes
M3 = All ports - M3
T4 = A, B & P ports - 4mm barb fitting R1 & R2 ports - M3

[3] Electrical connection
C2 = C type plug in connector with surge protection and lamp. 300mm long lead wire.

[4] Voltage code
KZ = 24v DC (standard)
JZ = 12v DC (option)
FZ = 6v DC (option)
GZ = 5v DC (option)

Preferred model selection

Model	Description
4SAO10-M3-C2-**	5 port, 2 position, solenoid pilot actuated, pilot air return.
4SAO20-M3-C2-**	5 port, 2 position, solenoid pilot actuated at both ends.
4SAO30-M3-C2-**	5 port, 3 position, spring centred, solenoid pilot actuated at both ends, pressure held neutral.
4SAO40-M3-C2-**	5 port, 3 position, spring centred, solenoid pilot actuated at both ends, pressure release neutral.
4SAO50-M3-C2-**	5 port, 3 position, spring centred, solenoid pilot actuated at both ends, pressure applied neutral.

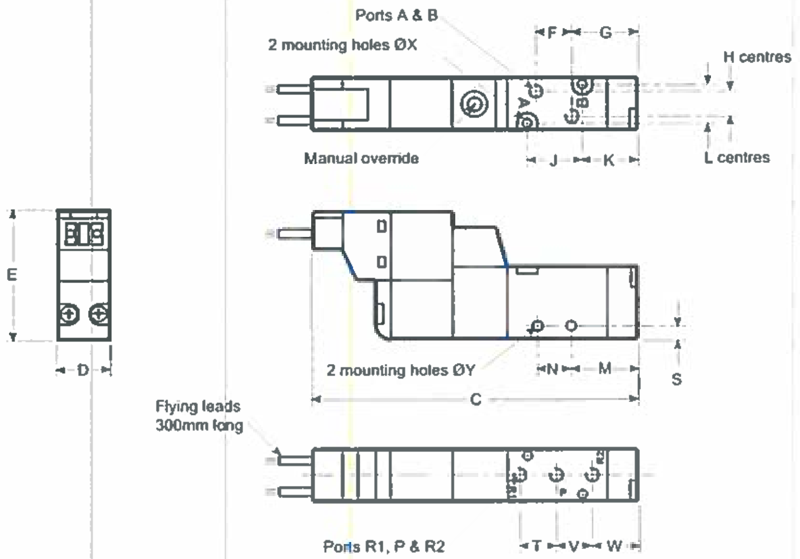
*** = Solenoid voltage code - to be specified (see position [4] above)*

4. Operating data

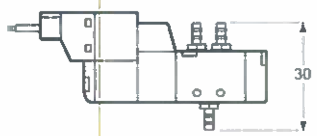
Flow factors to ISO6358 (BS7294)	Kv = 1.43 (2 position), 1.14 (3 position) Cv = 0.10 (2 position), 0.08 (3 position)	
Flow to atmosphere	2 position - 1.66 dm^3/sec (3.51 scfm) 3 position - 1.33 dm^3/sec (2.82 scfm)	
Operating pressure	4SAO10 - 1.5 to 7 bar (21 to 100psig) 4SAO20 - 1.0 to 7 bar (14 to 100 psig) 3 position - 2.0 to 7 bar (28 to 100 psig)	
Ambient operating temperature range	5^0C to 50^0C (41^0F to 122^0F)	
Response times at 6.3bar (90psig)	2 position - 20msec or less 3 position - 30msec or less	
Type of connection and port sizes	M3 (all ports) 4mm barbed fitting (A, B & P ports), M3 (R1 & R2 ports)	
Materials of construction	Body - Aluminium alloy Pistons - Polyacetal Seals - Nitrile	Spool - Aluminium Spring - Stainless steel
Manual override	Non lock type (for lock type option - Order as type M1)	
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.	
Installation dimensions	See pages P4 1.2	
Mass	4SAO10-M3-C2-** 23g 3 position 39g	4SAO20-M3-C2-** 35g
Manifolds	For details see pages P4 1.3 - 4	
Solenoid coils	Class B moulded coil. Nominal voltages - See position [4] of model code above Voltage tolerance +10% to -10% Coil consumption at nominal voltage - 1.0W Holding current - 42 milliamps Surge protection and indicator lamp standard 300mm flying lead standard	
Service kits	Replace unit	

5. Installation dimensions in mm

4SAO10 - M3 - C2 - **



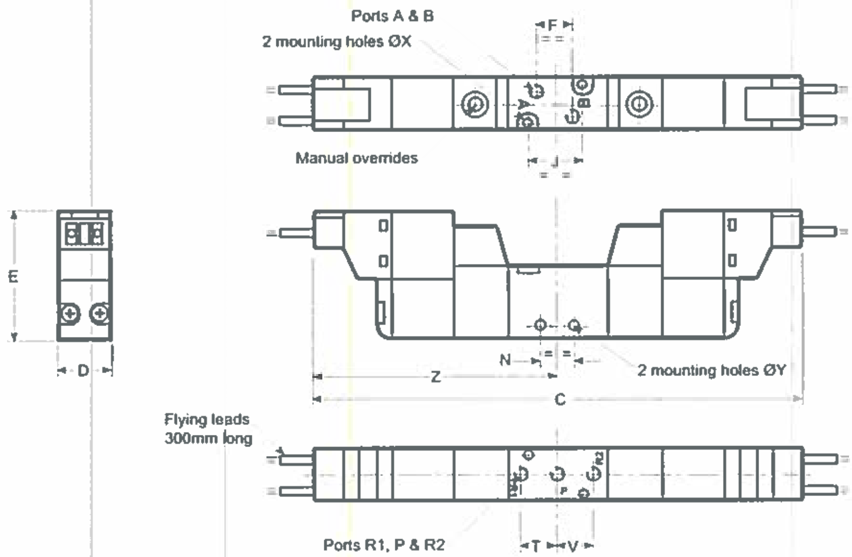
4SAO10-T4- C2 - **



Note: *This drawing is reproduced to a scale of 50% (Copy twice at 141% to give full size)*

Model number	Ports A, B, R1, P, R2	C	D	E	F	G	H	J	K	L	M	N	S	T	V	W	X	Y
4SAO10-M3-C2-**	M3	62	10	24	6.9	12.3	4.8	10.3	10.5	7.4	12.8	6.4	2.5	6.9	6.9	8.8	1.8	2.1

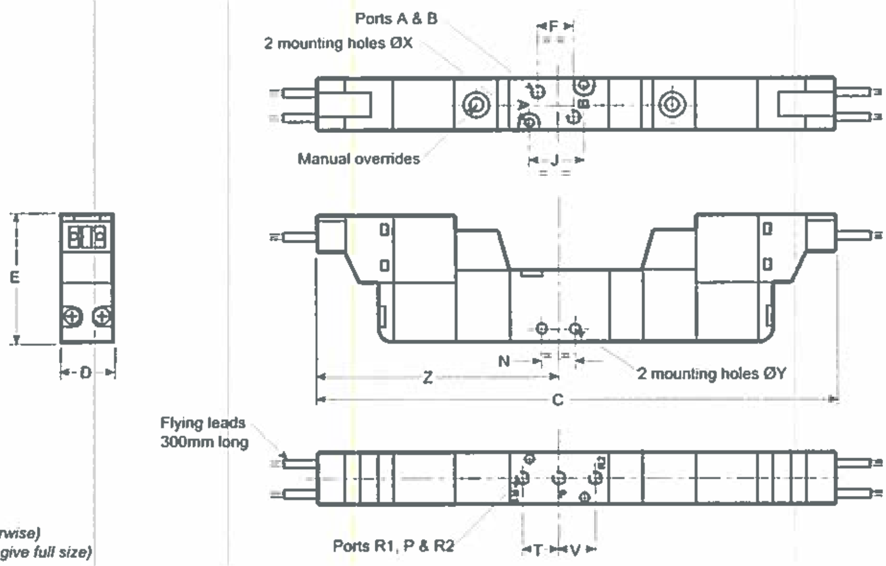
4SAO20-M3 - C2 - **



Model number	C	Z
4SAO20-M3-C2-**	92	46

All other dimensions as for model number 4SAO10-M3-C2-** above

4SAO30-M3 - C2 - **, 4SAO40-M3-C2-**, 4SAO50-M3-C2-**



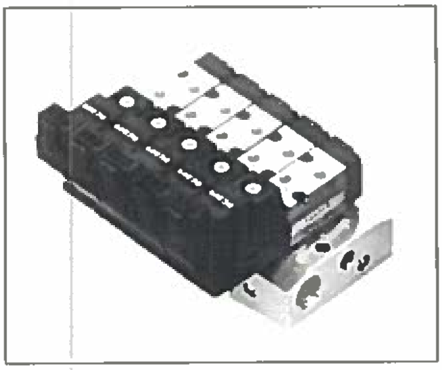
Model number	C	Z
4SAO30-M3-C2-**	99	46
4SAO40-M3-C2-**	99	46
4SAO50-M3-C2-**	99	46

All other dimensions as for model number 4SAO10-M3-C2-** above

Note: *All drawings on this page (except where stated otherwise) are reproduced to a scale of 70% (Copy at 141% to give full size)*

CKD picosol spool valves
Series M4SAO manifolds

4mm barb tube fitting, M3 - 5/2 and 5/3
2.5, 4, 6, 8, 10, 12, 16, 20, 25mm



1. General description and application benefits

A range of manifolded valves of 2 to 20 stations with M5 common supply and G1/8" common exhaust connections using 4SAO series body ported valves.

Masking plates are available for blanking off any stations retained for future extension of the system.

- Compact unit for panel installations.
- Ease of fitting additional valves at a future date.
- Surge killer as standard.
- Common supply and exhaust.
- Neon indicator as standard.
- Pre wired solenoid leads as standard.

2. Model code

M4SAO * 0 - * * - * * - N - * *
[1] [2] [3] [4] [5]

[1] Position / operator
1 = 2 position single solenoid
2 = 2 position double solenoid
3 = 3 position double solenoid, pressure held neutral.
4 = 3 position double solenoid, pressure release neutral.
5 = 3 position double solenoid, pressure applied neutral.
8 = Mixed manifold

[2] Port sizes
In all cases Port P - M5, Port R - G1/8"
M3 = Ports A & B - M3
T4 = Ports A & B - 4mm barb fitting

[3] Electrical connection
C2 = C type plug in connector with surge protection and lamp. 300mm long lead wire.

[4] Number of stations
N = Number of stations

[5] Voltage code
KZ = 24v DC (standard)
JZ = 12v DC (option)
FZ = 6v DC (option)
GZ = 5v DC (option)

Preferred model selection

M4SAO10 - M3 - C2 - N - **	Manifold with 4SAO10 series valves in all stations (A & B ports - M3, P ports - M5, R ports - G1/8")
M4SAO20 - M3 - C2 - N - **	Manifold with 4SAO20 series valves in all stations (A & B ports - M3, P ports - M5, R ports - G1/8")
M4SAO30 - M3 - C2 - N - **	Manifold with 4SAO30 series valves in all stations (A & B ports - M3, P ports - M5, R ports - G1/8")
M4SAO40 - M3 - C2 - N - **	Manifold with 4SAO40 series valves in all stations (A & B ports - M3, P ports - M5, R ports - G1/8")
M4SAO50 - M3 - C2 - N - **	Manifold with 4SAO50 series valves in all stations (A & B ports - M3, P ports - M5, R ports - G1/8")
M4SAO80 - MP	Masking plate

*** = Solenoid voltage code - to be specified (see position [5] above)*

N = Number of stations (2 - 20)
i.e. 10 station manifold with 4SAO10-M3-C2-** valves at every station should be ordered as **M4SAO10 - M3 - C2 - 10 - ****

T4 Series manifolds - Supplied as the M5 series manifold with 4mm barbed fitting screwed into the A & B ports.

Mixed manifolds

When a mixed combination manifold (valve types and/or masking plates) is required specify 8 in position [1] of the model code of the manifold and add station details (as shown below) to the end of the code.

M 4 S A O 8 0 - * * - C2 - N - * * - S1 S2 S3 S4 S5 MP (Locations)
[1] [2] [3] [4] [5] [6] [7]

[6] Number of stations with function:-
S1 = 2 position single solenoid valves (4SAO10 series)
S2 = 2 position double solenoid valves (4SAO20 series)
S3 = 3 position double solenoid valves, pressure held neutral (4SAO30 series)
S4 = 3 position double solenoid valves, pressure release neutral (4SAO40 series)
S5 = 3 position double solenoid valves, pressure applied neutral (4SAO50 series)
MP = Masking plates

[7] Station locations of items
Station number 1 is at left hand.

Notes : *(1) If 10 or more valves of the same type (or masking plates) are required use code letters not numbers :-*
A = 10, B = 11, C = 12, D = 13, E = 14, F = 15, G = 16, H = 17, I = 18, J = 19, K = 20.
(2) If valves of a particular function are not required put 0 in that position.

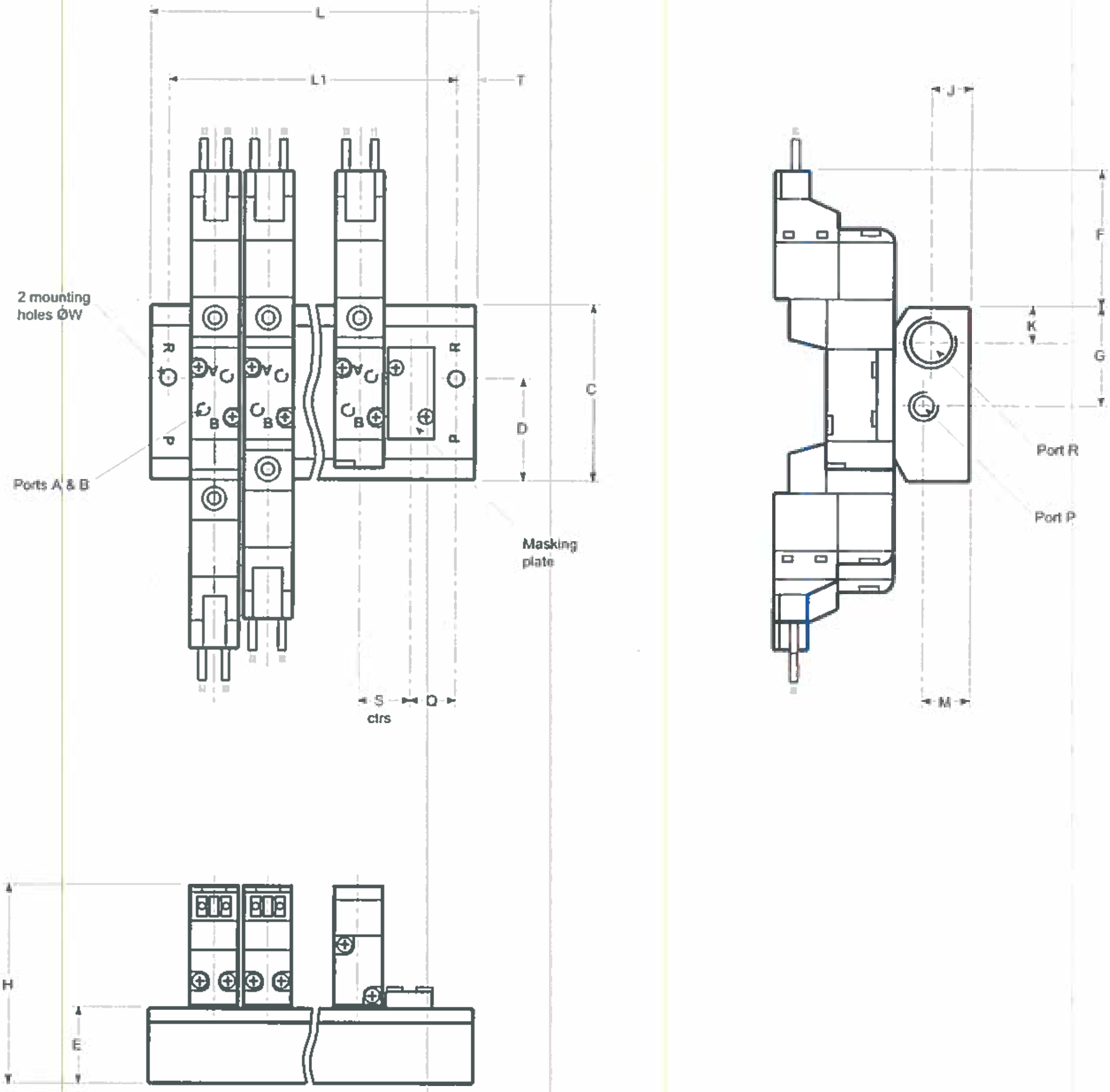
Example
A 7 station combination manifold having:- 2 off 4SAO10-M3-C2-KZ valves in positions 1 & 6,
2 off 4SAO20-M3-C2-KZ valves in positions 2 & 3
2 off 4SAO40-M3-C2-KZ valves in positions 4 & 5
and 1off masking plate in position 7 would be ordered as

M4SAO80-M5-C2-7-KZ-220201 (S1=1.6, S2=2.3, S4=4.5, MP=7)

(All manifold assemblies will be given a unique SV part number for model traceability)

3. Installation dimensions in mm

M4SAO*0 - * * - C2 - N - * *



Model Number	Ports A & B	Port P	Port R	C	D	E	F	G	H	J
M4SAO*0 - M3 - C2 - N - **	M3	2xM5	2xG1/8"	36	21	15.5	28	20	40	8
M4SAO*0 - T4 - C2 - N - **	4mm tube barb fitting	2xM5	2xG1/8"	36	21	15.5	28	20	40	8

N = Number of stations

K	L	L1	M	Q	S	T	W
7	Nx10.5+15.5	Nx10.5+8.5	9.5	9.5	10.5	4	3.3
7	Nx10.5+15.5	Nx10.5+8.5	9.5	9.5	10.5	4	3.3

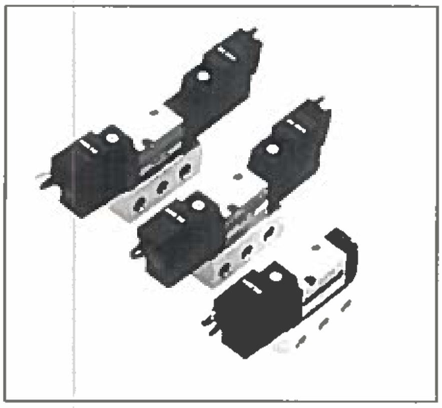
***Note:** All drawings on this page are reproduced to a scale of 70% (Copy at 141% to give full size)*

VICKERS

Pneumatics

CKD picosol spool valves
Series 4SBO - Sub base mounted

M5 - 5/2 and 5/3
2.5, 4, 6, 8, 10, 12, 16, 20, 25mm



1. General description and application benefits

A range of high performance, miniature, pilot solenoid operated, sub base mounted spool valves .
Available in 5 port, 2 position or 5 port, 3 position sub base mounted versions.

- High flow.
- Miniature size - only 10mm wide.
- Lube free.
- Lamp and surge protection as standard.
- Low power - 1W.
- Manual override as standard.
- Pre wired solenoid leads as standard.

2. Functional symbols

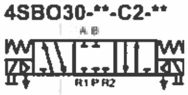
4SBO10--C2-****

5 port, 2 position.
Solenoid pilot actuated.
Internal pilot air return.

4SBO20--C2-****

5 port, 2 position.
Solenoid pilot actuated at both ends.

4SBO30--C2-****



5 port, 3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Pressure held neutral.

4SBO40--C2-****

5 port, 3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Pressure release neutral.

4SBO50--C2-****

5 port, 3 position.
Spring centred.
solenoid pilot actuated at both ends.
Pressure applied neutral.

For additional model types request catalogue CC-N-287A.

3. Model code

4SBO * 0 - M5 - * * - * *

[1] [2] [3]

[1] Position / operator
1 = 2 position single solenoid
2 = 2 position double solenoid
3 = 3 position double solenoid, pressure held neutral.
4 = 3 position double solenoid, pressure release neutral.
5 = 3 position double solenoid, pressure applied neutral.

[2] Electrical connection
C2 = C type plug in connector with surge protection and lamp. 300mm long lead wire.

[3] Voltage code
KZ = 24v DC (standard)
JZ = 12v DC (option)
FZ = 6v DC (option)
GZ = 5v DC (option)

Preferred model selection

4SBO10-M5-C2-**	5 port, 2 position, solenoid pilot actuated, pilot air return.
4SBO20-M5-C2-**	5 port, 2 position, solenoid pilot actuated at both ends.
4SBO30-M5-C2-**	5 port, 3 position, spring centred, solenoid pilot actuated at both ends, pressure held neutral.
4SBO40-M5-C2-**	5 port, 3 position, spring centred, solenoid pilot actuated at both ends, pressure release neutral.
4SBO50-M5C2-**	5 port, 3 position, spring centred, solenoid pilot actuated at both ends, pressure applied neutral.

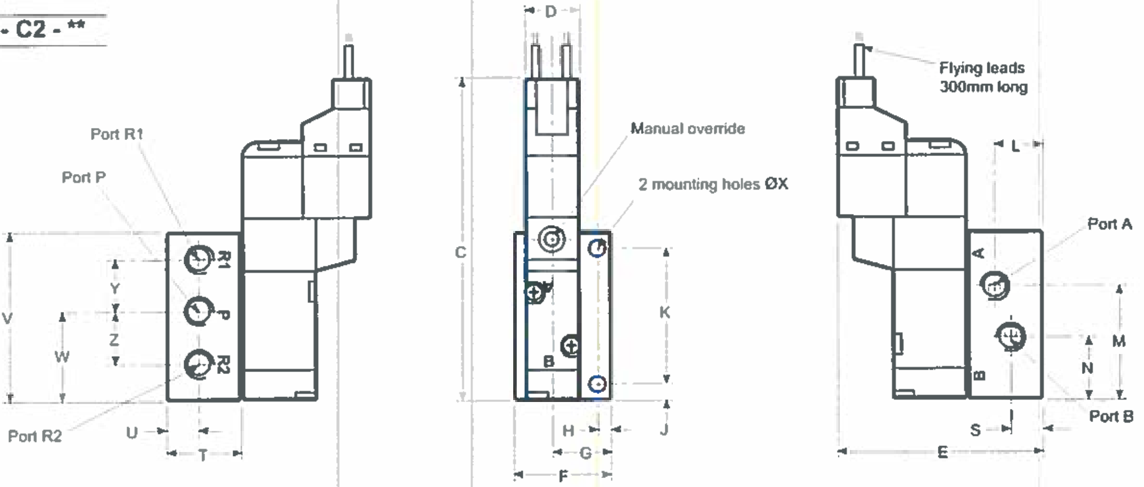
*** = Solenoid voltage code - to be specified (see position [3] above)*

4. Operating data

Flow factors to ISO6358 (BS7294)	Kv = 1.43 (2 position), 1.14 (3 position) Cv = 0.10 (2 position), 0.08 (3 position)	
Flow to atmosphere	2 position - 1.66 dm³/sec (3.51 scfm) 3 position - 1.33 dm³/sec (2.82 scfm)	
Operating pressure	4SBO10 - 1.5 to 7 bar (21 to 100psig) 4SBO20 - 1.0 to 7 bar (14 to 100 psig) 3 position - 2.0 to 7 bar (28 to 100 psig)	
Ambient operating temperature range	5°C to 50°C (41°F to 122°F)	
Response times at 6.3bar (90psig)	2 position - 20msec or less 3 position - 30msec or less	
Type of connection and port sizes	M5 (all ports)	
Materials of construction	Body - Aluminium alloy Pistons - Polyacetal Seals - Nitrile	Spool - Aluminium Spring - Stainless steel
Manual override	Non lock type (for lock type option - order as type M1)	
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.	
Installation dimensions	See pages P4 2.2	
Mass	4SBO10-M5-C2-** 43g 3 position 59g	4SBO20-M5-C2-** 55g
Manifolds	For details see pages P4 2.3 - 4	
Solenoid coils	Class B moulded coil. Nominal voltages - See position [3] of model code above Voltage tolerance +10% to -10% Coil consumption at nominal voltage - 1.0W Holding current - 42 milliamps Surge protection and indicator lamp standard 300mm flying lead standard	
Service kits	Replace unit	

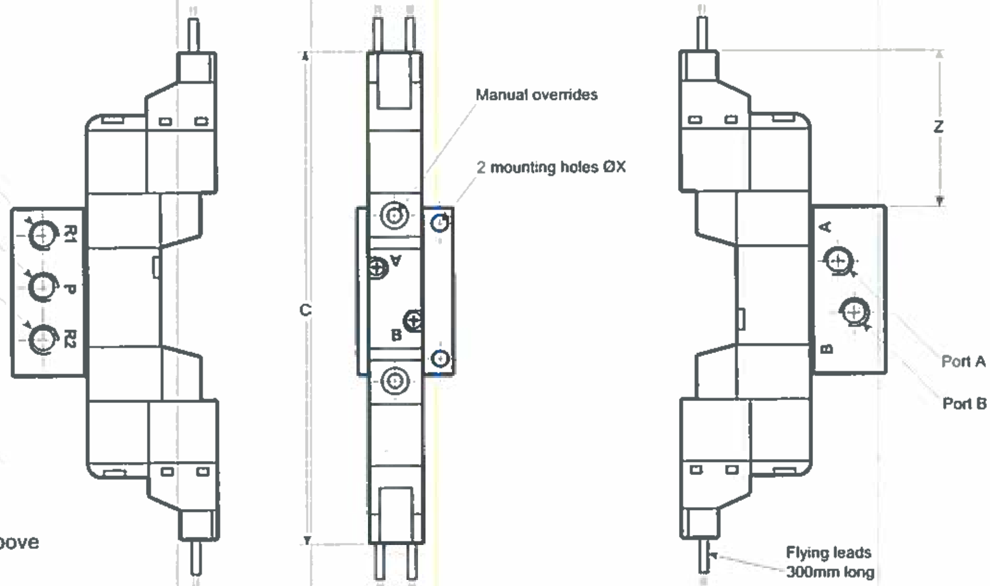
5. Installation dimensions in mm

4SBO10 - M5 - C2 - **



Model number	Ports A, B, R1, P, R2	C	D	E	F	G	H	J	K	L	M	N	S	T	U	V	W	X	Y	Z
4SBO10-M5-C2-**	M5	62	10	38.5	18	11	2.5	3	26	9	21.4	11.7	6	14	6	32	17	3.2	10	10

4SBO20-M5 - C2 - **

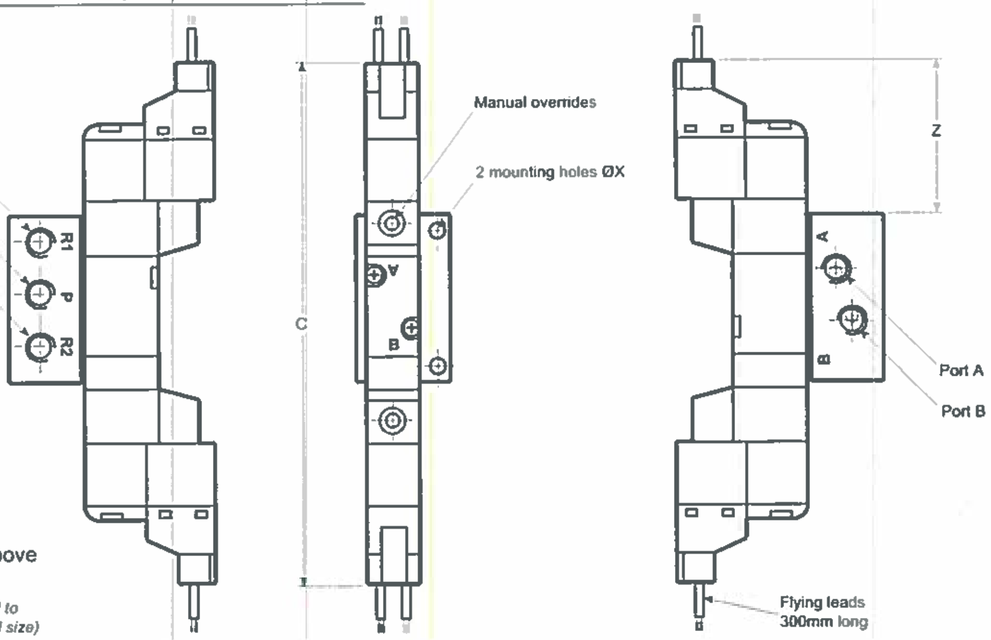


Port R1
Port P
Port R2

Model number	C	Z
4SBO20-M5-C2-**	92	30

All other dimensions as for model number 4SBO10-M5-C2-** above

4SBO30-M5 - C2 - **, 4SBO40-M5-C2-**, 4SBO50-M5-C2-**



Port R1
Port P
Port R2

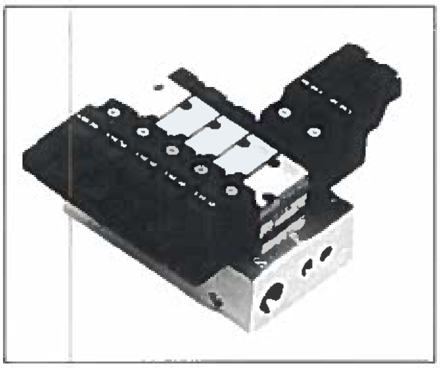
Model number	C	Z
4SBO30-M5-C2-**	99	30
4SBO40-M5-C2-**	99	30
4SBO50-M5-C2-**	99	30

All other dimensions as for model number 4SBO10-M5-C2-** above

Note: *All drawings on this page are reproduced to a scale of 70% (Copy at 141% to give full size)*

CKD picosol spool valves
Series M4SBO manifolds

M5, 4mm or 6mm barb tube fitting, 4mm push in fitting - 5/2 and 5/3
2.5, 4, 6, 8, 10, 12, 16, 20, 25mm



1. General description and application benefits

A range of manifolded valves of 2 to 20 stations with M5 common supply and G1/8" common exhaust connections using 4SBO series sub base mounted valves. Load ports M5, barb tube fitting (4mm or 6mm) or push in fitting (4mm).

Masking plates are available for blanking off any stations retained for future extension of the system.

- Compact unit for panel installations.
- Ease of fitting additional valves at a future date.
- Surge protection as standard.
- Common supply and exhaust.
- Pre wired solenoid leads as standard.
- Neon indication.

2. Model code

M 4 S B O * 0 - * * - * * - N - * *

[1] [2] [3] [4] [5]

[1] Position / operator
1 = 2 position single solenoid
2 = 2 position double solenoid
3 = 3 position double solenoid, pressure held neutral.
4 = 3 position double solenoid, pressure release neutral.
5 = 3 position double solenoid, pressure applied neutral.
8 = Mixed manifold

[2] Port sizes
In all cases Port P - M5, Port R - G1/8"
M5 = Ports A, B - M5
T4 = Ports A & B - 4mm barb fitting
T6 = Ports A & B - 6mm barb fitting
GS4 = Ports A & B - 4mm push in fitting

[3] Electrical connection
C2 = C type plug in connector with surge protection and lamp. 300mm long lead wire.

[4] Number of stations
N = Number of stations

[5] Voltage code
KZ = 24v DC (standard)
JZ = 12v DC (option)
FZ = 6v DC (option)
GZ = 5v DC (option)

Preferred model selection

M4SBO10 - M5- C2 - N - **	Manifold with 4SBO10 series valves in all stations (A & B ports - M5, P ports - M5, R ports - G1/8")
M4SBO20 - M5 - C2 - N - **	Manifold with 4SBO20 series valves in all stations (A & B ports - M5, P ports - M5, R ports - G1/8")
M4SBO30 - M5- C2 - N - **	Manifold with 4SBO30 series valves in all stations (A & B ports - M5, P ports - M5, R ports - G1/8")
M4SBO40 - M5 - C2 - N - **	Manifold with 4SBO40 series valves in all stations (A & B ports - M5, P ports - M5, R ports - G1/8")
M4SBO50 - M5 - C2 - N - **	Manifold with 4SBO50 series valves in all stations (A & B ports - M5, P ports - M5, R ports - G1/8")
M4SBO80 - MP	Masking plate

*** = Solenoid voltage code - to be specified (see position [5] above)*

N = Number of stations (2 - 20)
i.e. 15 station manifold with 4SBO10-M5-C2-** valves at every station should be ordered as **M4SBO10 - M5 - C2 - 15 - ****

T4, T6 & GS4 Series manifolds - Supplied as the M5 series manifold with corresponding fittings screwed into the A & B ports.

Mixed manifolds

When a mixed combination manifold (valve types and/or masking plates) is required specify **8** in position [1] of the model code of the manifold and add station details (as shown below) to the end of the code.

M 4 S B O 8 0 - * * - C2 - N - * * - S1 S2 S3 S4 S5 MP (Locations)

[1] [2] [3] [4] [5] [6] [7]

[6] Number of stations with function:-
S1 = 2 position single solenoid valves (4SBO10 series)
S2 = 2 position double solenoid valves (4SBO20 series)
S3 = 3 position double solenoid valves, pressure held neutral (4SBO30 series)
S4 = 3 position double solenoid valves, pressure release neutral (4SBO40 series)
S5 = 3 position double solenoid valves, pressure applied neutral (4SBO50 series)
MP = Masking plates

[7] Station locations of items
Station number 1 is at left hand.

Notes : (1) If 10 or more valves of the same type (or masking plates) are required use code letters not numbers :- A = 10, B = 11, C = 12, D = 13, E = 14, F = 15, G = 16, H = 17, I = 18, J = 19, K = 20.
(2) If valves of a particular function are not required put 0 in that position.

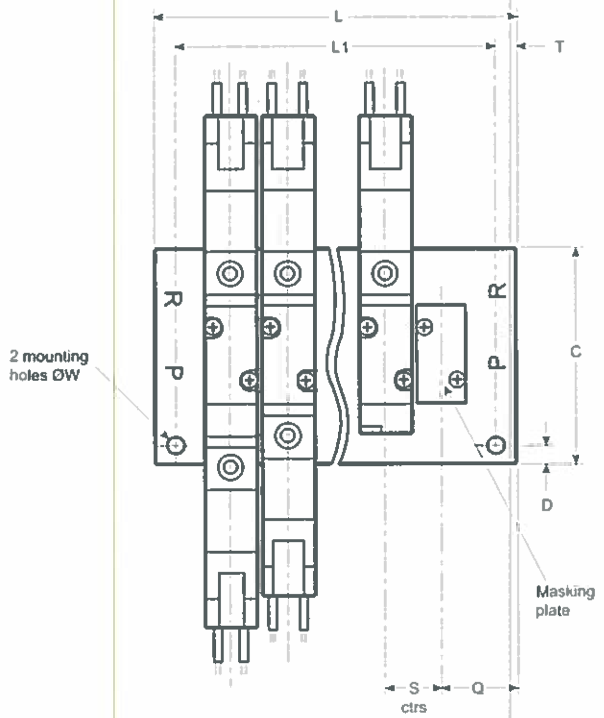
Example
A 9 station combination manifold having:-2 off 4SBO10-M3-C2-KZ valves in positions 1 & 8,
3 off 4SBO20-M3-C2-KZ valves in positions 2, 3 & 4
3 off 4SBO40-M3-C2-KZ valves in positions 5, 6 & 7
and 1off masking plate in position 9 would be ordered as

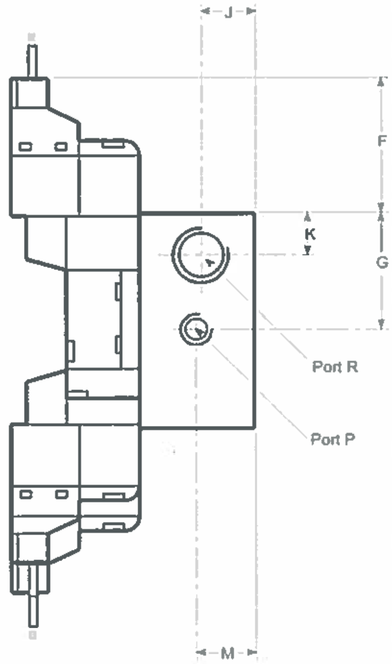
M4SBO80-M5-C2-9-KZ-230301 (S1=1.8, S2=2.3.4, S4=5.6.7, MP=9)

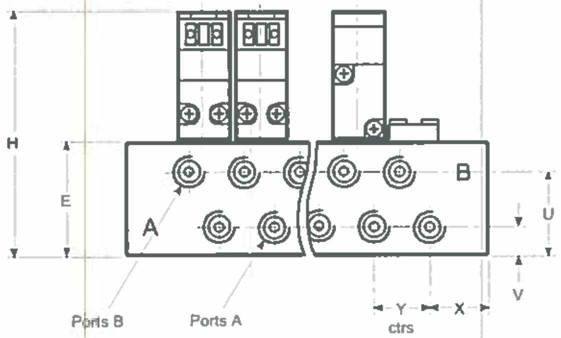
(All manifold assemblies will be given a unique SV part number for model traceability)

3. Installation dimensions in mm

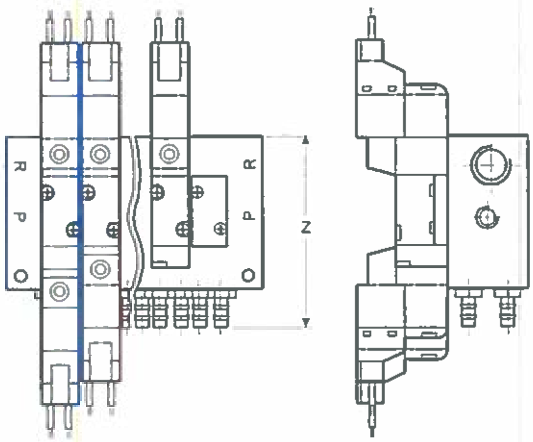
M4SBO*0 - M5 - C2 - N - * *

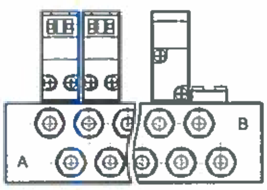






M4SBO*0-T4-C2-N-* *, M4SBO*0-T6-C2-N-* *, M4SBO*0-GS4-C2-N-* *





Model Number	Z
M4SBO*0-T4-C2-N-**	49
M4SBO*0-T6-C2-N-**	51
M4SBO*0-GS4-C2-N-**	55

Note: *These drawings are reproduced to a scale of 50%*
(Copy twice at 141% to give full size)

Note: *All drawings on this page (except where stated otherwise) are reproduced to a scale of 70% (Copy at 141% to give full size)*

Model Number	Ports A & B	Port P	Port R	C	D	E	F	G	H	J
M4SBO*0 - M5 - C2 - N - **	N x M5	2xM5	2xG1/8"	41	4	21.5	26	22	46	10

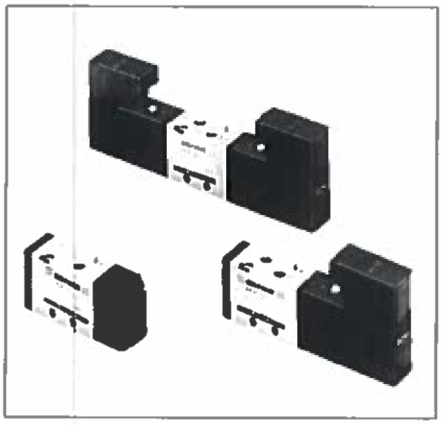
N = Number of stations

K	L	L1	M	Q	S	T	U	V	W	X	Y
8	Nx10.5+17.5	Nx10.5+9.5	11	14	10.5	4	16	5.5	4.5	11	10.5

VICKERS

CKD Selex spool valves Series KA1 body ported

M5, 4mm push-in, – 3/2, 5/2 and 5/3
10, 12, 16, 20, 25, 32, 40mm



1. General description and application benefits

A range of compact 3 port 2 position and 5 port 2 or 3 position directional control spool valves.
Solenoid or air operated for the control of single acting or double acting cylinders.

- Compact size – only 15mm wide
- Kv = 2.3 (Cv = 0.16)
- Lamp and surge protection
- Low power – 1.8W
- Free standing or manifold mounted
- Lube free
- Manual override as standard
- Pre wired solenoid leads available

2. Model code

*	KA1	* *	*	–	*	–	*	* *	*	*
1		2	3		4		5	6	7	8

1 Function
3 = 3 port valve (2 position).
4 = 5 port valve (2 or 3 position).

2 Positions
1 = 2 position, single operation (air or solenoid), spring return.
2 = 2 position, double operation (air or solenoid).
3 = 3 position double operation (air or solenoid), spring centred, all ports closed.
4 = 3 position, double operation (air or solenoid), spring centred, load ports open to exhaust ports.
5 = 3 position, double operation (air or solenoid), spring centred, load ports open to supply port.
11 = 2 position, single operation (air or solenoid), spring return, normally open. (3 port valve only).

3 Mode of operation
0 = Solenoid operated
1 = Air operated

4 Pipe size
M5 = M5 x 0.8
GS4† = 4mm push-in fitting. (part No ZH-045M)

5 Manual override
No mark = Non lock type.

6 Wiring
C3 = C type connector with surge killer and lamp.
B† = Small terminal box. (part No 885548)

7 Options
No mark = Without mounting plate.
P† = With mounting plate (part No 4KA1–P)

8 Voltage
KZ = 24v DC
RY = 110v AC 50/60Hz
SY = 220v AC 50/60Hz
JZ = 12v DC (option)

Note: 1) † The features shown are offered as standard variants – see section 4 on page KAV 1.2 for details of method of supply.
2) For preferred model selection see section 3 on page KAV 1.2

3. Preferred model selection and mass

The products listed represent the standard product range most readily available

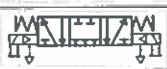
3KA1 Series – Solenoid operated 3/2

Model code	Symbol	Description	Mass
3KA110 – M5 – C3**		3 port, 2 position, solenoid pilot actuated, spring return, normally closed.	0.090kg
3KA1110 – M5 – C3**		3 port, 2 position, solenoid pilot actuated, spring return, normally open.	0.090kg
3KA120 – M5 – C3**		3 port, 2 position, solenoid pilot actuated at both ends.	0.125kg

3KA1 Series – Air operated 3/2

Model code	Symbol	Description	Mass
3KA111 – M5		3 port, 2 position, air actuated, spring return, normally closed.	0.046kg
3KA1111 – M5		3 port, 2 position, air actuated, spring return, normally open.	0.046kg
3KA121 – M5		3 port, 2 position, air actuated at both ends.	0.051kg

4KA1 Series – Solenoid operated 5/2 and 5/3

Model code	Symbol	Description	Mass
4KA110 – M5 – C3**		5 port, 2 position, solenoid pilot actuated, spring return.	0.090kg
4KA120 – M5 – C3**		5 port, 2 position, solenoid pilot actuated at both ends.	0.130kg
4KA130 – M5 – C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, all ports closed.	0.150kg
4KA140 – M5 – C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to exhaust ports.	0.150kg
4KA150 – M5 – C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to supply port.	0.150kg

4KA1 Series – Air operated 5/2 and 5/3

Model code	Symbol	Description	Mass
4KA111 – M5		5 port, 2 position, air actuated, spring return.	0.046kg
4KA121 – M5		5 port, 2 position, air actuated at both ends.	0.050kg
4KA131 – M5		5 port, 3 position, spring centred, air actuated at both ends, all ports closed.	0.060kg
4KA141 – M5		5 port, 3 position, spring centred, air actuated at both ends, load ports open to exhaust ports.	0.060kg
4KA151 – M5		5 port, 3 position, spring centred, air actuated at both ends, load ports open to supply port.	0.060kg

Note: 1) Graphical symbols ref ISO 1219 (BS 2917)

*2) ** = Solenoid voltage code – to be specified (see position [8] on page KAV 1.1)*

4. Standard variants

[4] Pipe size

GS4 = 4mm push-in fitting — Will be supplied as standard valve with required number of fittings ref **ZH-045M** provided loose for fitting by customer.

[6] Wiring

B = Small terminal box — Achieved by removing existing connector as supplied and fitting miniatu e DIN plug and sealing washer ref 885548 which will be supplied loose.

[7] Options

P = Mounting plate — To be ordered separately (part number 4KA1–P)

5. Non standard variants

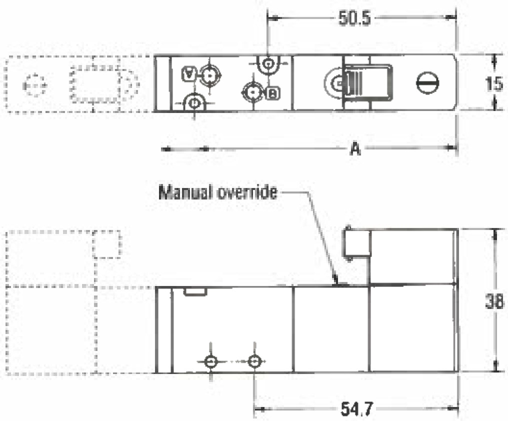
All other catalogued variants will be available to **special order only.**

6. Operating data

Flow factors to ISO 6358 (BS 7294)	Kv = 2.3 (Cv = 0.16)
Minimum pilot air pressure at 6.3 bar (90 psig) body pressure	2 position valves 1.5 bar (21.8 psig) 3 position valves 2.0 bar (29.0 psig)
Maximum operating pressure	7 bar (101.5 psig)
Operating media	Compressed air or inert gas
Media operating temperature	+5°C to +50°C (41°F to 122°F)
Ambient operating temperature	–5°C to +50°C (23°F to 122°F)
Response times	2 position valves – less than 30 milliseconds 3 position valves – less than 60 milliseconds
Cycling rate at 6.3 bar (90 psig)	240 cycles per minute at 20°C (68°F) ambient
Type of connection	Main and pilot ports – screwthread body ported M5
Type of lubricant	Non lube therefore not essential but if installed in lubricated system use ISO VG37 mineral oil
Solenoid coils	Class B moulded coil Voltage tolerance +10% to –10% Coil consumption at nominal voltage and 20°C (68°F) – 1.8W Surge protection and indicator lamp standard
Service kits	

7. Installation dimensions in mm

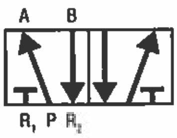
Solenoid operated versions



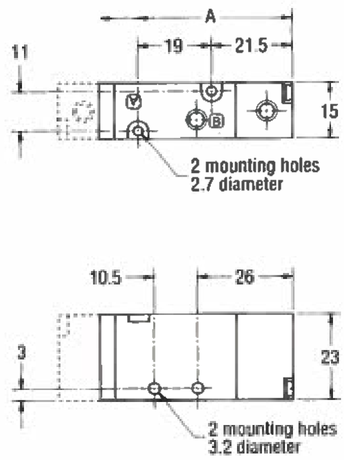
Main ports M5

Model code	A
3KA110, 3KA1110	80
3KA 120	120
4KA110	80
4KA120	120
4KA130, 4KA140, 4KA150	132.5

Porting configuration



Air operated versions



Main and pilot ports M5

Model code	A
3KA111, 3KA1111	51
3KA 121	62
4KA111	51
4KA121	62
4KA131, 4KA141, 4KA151	74.5

8. Ordering procedure

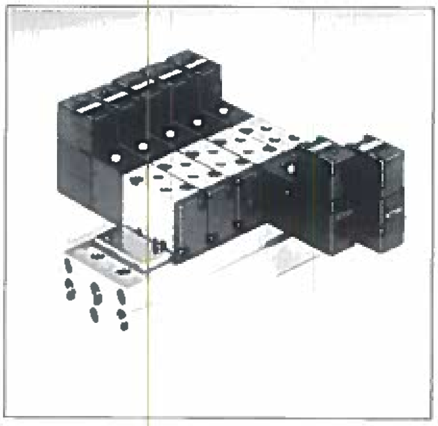
Preferred models
Order as preferred model selection.
** When ordering solenoid operated versions ensure solenoid voltage code is added to model code.

Standard variants
Typical model code:- **4KA120 – GS4 – BPRY**
Will be supplied as:- **4KA120 – M5 – C3RY** valve with
5 off **ZH-045M** push-in fittings
2 off **885548** miniature DIN plugs
and 1 off **4KA1 – P** mounting plate

VICKERS

CKD Selex spool valves Series M4KA1 manifolds

1/8" BSP Common supply and exhaust ports



1. General description and application benefits

A range of manifold plates of 1 to 20 stations with G1/8" supply and exhaust ports for use with the KA1 Series of compact body ported Selex valves.

Manifold plates supplied complete with all required gaskets and mounting screws.

Manifold plates supplied as sub plate having required number of stations plus end blocks (1 pair) and complete with all required seals, gaskets and mounting screws.

Masking plates available for blanking off any stations retained for future extension of system.

- Compact unit for panel installations
- Mixed valve types on one manifold – 3 or 4 way (air/single solenoid/double solenoid)
- Ease of fitting additional valves at future date
- Flexibility of mounting position for valves
- DIN rail mounting option
- Interface plate options

2. Model code and mass

Model code	Description	Mass
V3-600565-**	Manifold plate	0.05kg + 0.036kg per station
M4KA1-MP	Masking plate	0.023kg

*** = Number of stations (1-20) i.e. 10 station manifold plate should be ordered as V3-600565-10.*

Manifold plates

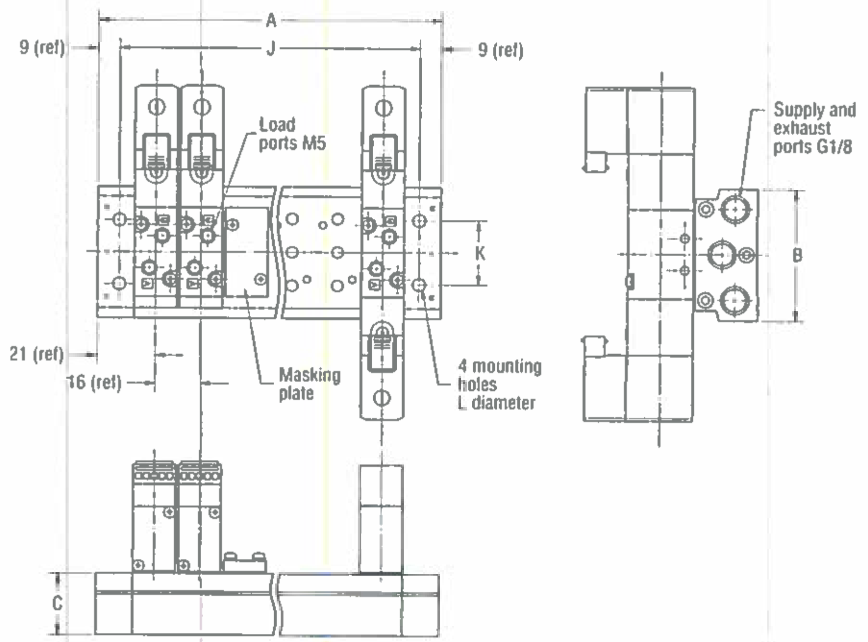
Manifold plates are to be ordered with required number of stations (1 – 20) to suit customers installation requirements.

Note: *Manifold plates include end blocks (1 pair), 'O' rings (6 off), cap screws (6 off) and 1 off interface gasket (F4-129968) plus 2 off valve mounting screws (885541) per station.*

Masking plate

For blanking off stations required for future extension.

3. Installation dimensions in mm



A	B	C	J	K	L
N x 16 + 26	47	22	N x 16 + 8	16.5	4.5

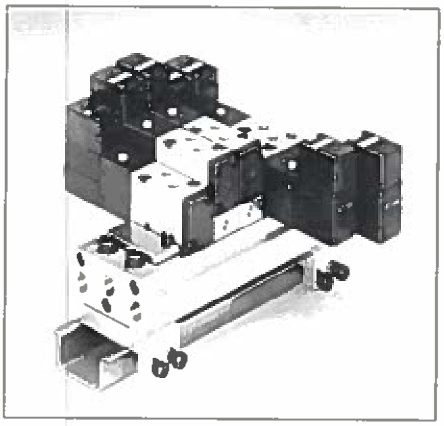
N = Number of stations

Note: *When operating more than 6 valves simultaneously connect air feed to both ends of manifold plate and keep all exhaust ports open.*

4. Ordering procedure

Order number and type of valves required in accordance with the preferred model selection shown on page KAV 1.2 and the manifold plate to suit installation requirements in accordance with model code shown above plus any masking plates.

CKD Selex spool valves Series 4KA1 accessories



1. General description and application benefits

Products for use with 4KA1 series manifold plates and valves.

DIN rail mounting plates
Mounting plates which allow M4KA1 series manifold assemblies to be mounted on 35mm DIN rail (EN 50022).

- Additional mounting versatility
- Ideal for control panel applications

Interface plates
Permits independent supply or exhaust connections (M5) to be made to individual stations.

- Individual higher/lower pressure supply
- Individual exhaust for greater control of cylinder speed

Pre wired solenoid lead
Pre wired lead of 3 metre length with sheath protected plug which connects directly into solenoid valve.
Other lengths available on request.

- Saving in installation time

2. Model code and mass

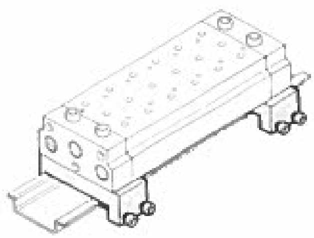
Model code	Description	Mass
M4KA1-DIN	DIN rail mounting plates (pair)	0.082kg
M4KA1-SP	Interface supply plate	0.017kg
M4KA1-EP	Interface exhaust plate	0.017kg
C3-FL3	Pre wired solenoid lead (3m)	0.135kg

DIN rail mounting plates

Supplied as a pair complete with mounting screws (4 off) for fixing to manifold end blocks and for clamping to DIN rail (4 off).

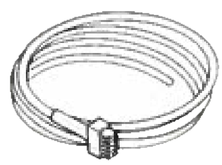
Interface plates
Supplied complete with 1 off interface gasket (F4-129968) and 2 off mounting screws (885606).

DIN rail mounting plate



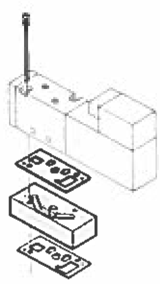
M4KA1-DIN

Pre wired solenoid lead



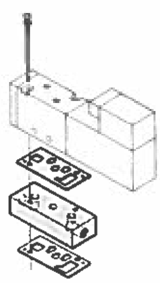
C3-FL3

Interface supply plate



M4KA1-SP

Interface exhaust plate



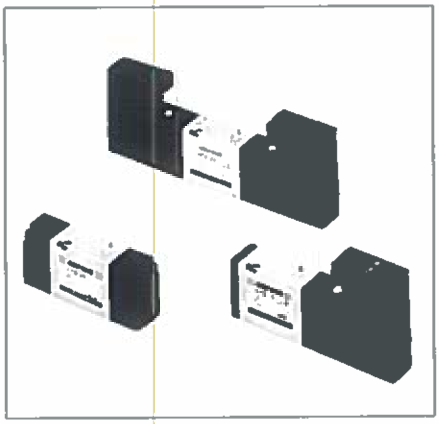
M4KA1-EP

3. Ordering procedure

Order in accordance with model code shown above to suit installation requirements.

CKD Selex spool valves
Series 4KB1 sub plate or manifold mounting

1/8" BSP – 4/2 and 4/3
10, 12, 16, 20, 25, 32, 40mm



1. General description and application benefits

A range of compact 4 port ($^5/_2$ and $^5/_3$) 2 or 3 position directional control spool valves. (Common exhaust connection). Solenoid or air operated for the control of single acting or double acting cylinders.

- Compact size – only 15mm wide
- Kv = 3.2 (Cv = 0.22)
- Lamp and surge protection
- Low power – 1.8W
- Sub plate or DIN rail mounted
- Lube free
- Manual override as standard
- Pe wired solenoid leads available

2. Model code

4	KB1	*	*	–	*	–	*	* *	*	*
1		2	3		4		5	6	7	8

1 Function
4 = 4 port valve
(2 or 3 position).

2 Positions
1 = 2 position, single operation (air or solenoid), spring return.
2 = 2 position, double operation (air or solenoid).
3 = 3 position, double operation (air or solenoid), spring centred, all ports closed.
4 = 3 position, double operation (air or solenoid), spring centred, load ports open to exhaust ports.
5 = 3 position, double operation (air or solenoid), spring centred, load ports open to supply port.

3 Mode of operation
8 = Air operated
9 = Solenoid operated

4 Pipe size
No mark = Valve only (sub plate to be ordered separately)

5 Manual override
No mark = Non lock type.

6 Wiring
C3 = C type connector with surge killer and lamp.
B† = Small terminal box (part No 885548)

7 Options
No mark = Standard valve

8 Voltage
KZ= 24v DC
RY= 110v AC 50/60Hz
SY= 220v AC 50/60Hz
JZ = 12v DC (option)

Note: 1) † The feature shown is offered as a standard variant – see section 4 on page KBV 1.2 for details of method of supply.
2) For preferred model selection see section 3 on page KBV 1.2

3. Preferred model selection and mass

The products listed represent the standard product range most readily available

Note: *Valves are supplied as sub-decks complete with 2 off mounting screws (885541) and 1 off interface gasket (F4–129968) for mounting to single sub plates, manifold plates or DIN rail mounted sub plates.*

4KB1 Series – Solenoid operated 4/2 and 4/3 (common exhaust)

Model code	Symbol	Description	Mass
4KB119–C3**		4 port, 2 position, solenoid pilot actuated, spring return.	0.097kg
4KB129–C3**		4 port, 2 position, solenoid pilot actuated at both ends.	0.148kg
4KB139–C3**		4 port, 3 position, spring centred, solenoid pilot actuated at both ends, all ports closed.	0.159kg
4KB149–C3**		4 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to exhaust ports.	0.159kg
4KB159–C3**		4 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to supply port.	0.159kg

4KB1 Series – Air operated 4/2 and 4/3 (common exhaust)

Model code	Symbol	Description	Mass
4KB118		4 port, 2 position, air actuated, spring return.	0.048kg
4KB128		4 port, 2 position, air actuated at both ends.	0.052kg
4KB138		4 port, 3 position, spring centred, air actuated at both ends, all ports closed.	0.062kg
4KB148		4 port, 3 position, spring centred, air actuated at both ends, load ports open to exhaust ports.	0.062kg
4KB158		4 port, 3 position, spring centred, air actuated at both ends, load ports open to supply port.	0.062kg

Note: *1) Graphical symbols ref ISO 1219 (BS 2917)*
*2) ** = Solenoid voltage code – to be specified (see position* [8] *on page KBV 1.1)*

4. Standard variant

[6] **Wiring**

B = Small terminal box — Achieved by removing existing connector as supplied and fitting miniature DIN plug and sealing washer ref 885548 which will be supplied loose.

5. Non standard variants

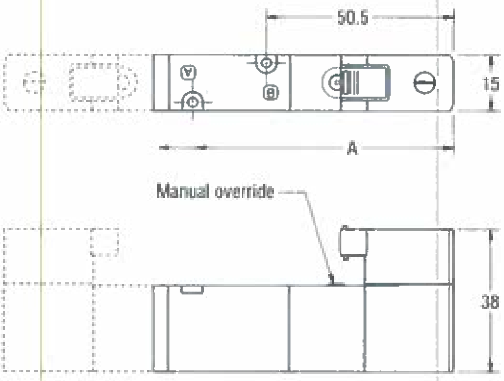
All other catalogued variants will be available **to special order ONLY.**

6. Operating data

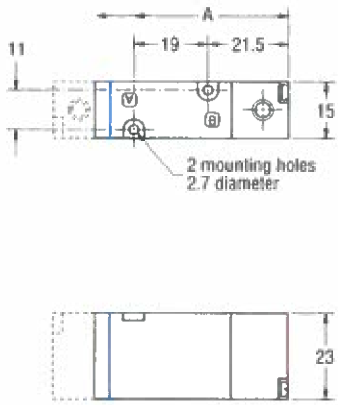
Flow factors to ISO 6358 (BS 7294)	Kv = 3.2 (Cv = 0.22)
Minimum pilot air pressure at 6.3 bar (90 psig) body pressure	2 position valves 1.5 bar (21.8 psig) 3 position valves 2.0 bar (29.0 psig)
Maximum operating pressure	7 bar (101.5 psig)
Operating media	Compressed air or inert gas
Media operating temperature	+5°C to +50°C (41°F to 122°F)
Ambient operating temperature	–5°C to +50°C (23°F to 122°F)
Response times	2 position valves – less than 30 milliseconds 3 position valves – less than 60 milliseconds
Cycling rate at 6.3 bar (90 psig)	240 cycles per minute at 20°C (68°F) ambient
Type of connection	Sub plate or manifold plate mounted
Type of lubricant	Non lube therefore not essential but if installed in lubricated system use ISO VG37 mineral oil
Solenoid coils	Class B moulded coil Voltage tolerance +10% to –10% Coil consumption at nominal voltage and 20°C (68°F) – 1.8W Surge protection and indicator lamp standard
Service kits	

7. Installation dimensions in mm

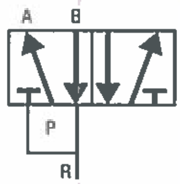
Solenoid operated versions



Air operated versions



Porting configuration



Pilot ports M5

Model code	A
4KB119	80
4KB129	120
4KB139, 4KB149, 4KB159	132.5

Model code	A
4KB118	51
4KB128	62
4KB138, 4KB148, 4KB158	74.5

8. Ordering procedure

Preferred models

Order as preferred model selection.

** When ordering solenoid operated versions ensure solenoid voltage code is added to model code.

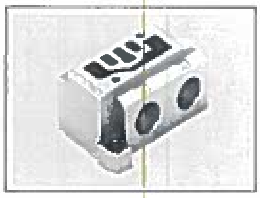
Standard variant

Typical model code:- **4KB129 – BRY**

Will be supplied as:- **4KB129 – C3RY** valve with 2 off **885548** miniature DIN plugs

CKD Selex valves Series 4KB1 single sub plate

1/8"BSP



1. General description and application benefits

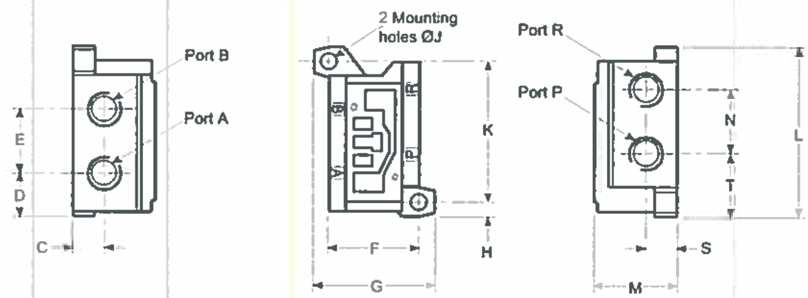
Single sub plate for use with 4KB1 series valves.

G1/8" supply, load and common exhaust ports.

2. Model code and mass

Size	Model	Mass
G1/8"	4KB1 - 06G	0.032kg

3. Installation dimensions in mm



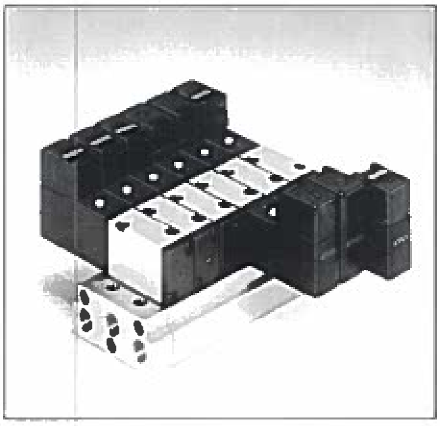
Port A	Port B	C	D	E	F	G	H	J	K	L	M	N	Port P	Port R	S	T
G1/8"	G1/8"	8.5	11.5	17	24	32	4	4.5	37.5	51	22	17	G1/8"	G1/8"	8.5	17

4. Ordering procedure

Order in accordance with model code shown.

CKD Selex spool valves Series M4KB1 manifolds

1/8" BSP common supply and exhaust ports M5 base ported load ports



1. General description and application benefits

A range of manifold plates of 1 to 20 stations with G1/8" supply and exhaust ports and M5 base ported load ports for use with the KB1 series of compact sub deck Selex valves.

Manifold plates supplied as sub plate having required number of stations plus end blocks (1 pair) and complete with all required seals, gaskets and mounting screws.

Masking plates available for blanking off any stations retained for future extension of system.

- Compact unit for panel installations
- Mixed valve types on one manifold – 3 or 4 way (air/single solenoid/double solenoid)
- Ease of fitting additional valves at future date
- Flexibility of mounting position for valves
- Interface plate options

2. Model code and mass

Model code	Description	Mass
V3-600732-**	Manifold plate	0.05kg + 0.036kg per station
M4KA1-MP	Masking plate	0.023kg

*** = Number of stations (1-20) i.e. 10 station manifold plate should be ordered as V3-600732-8.*

Manifold plates

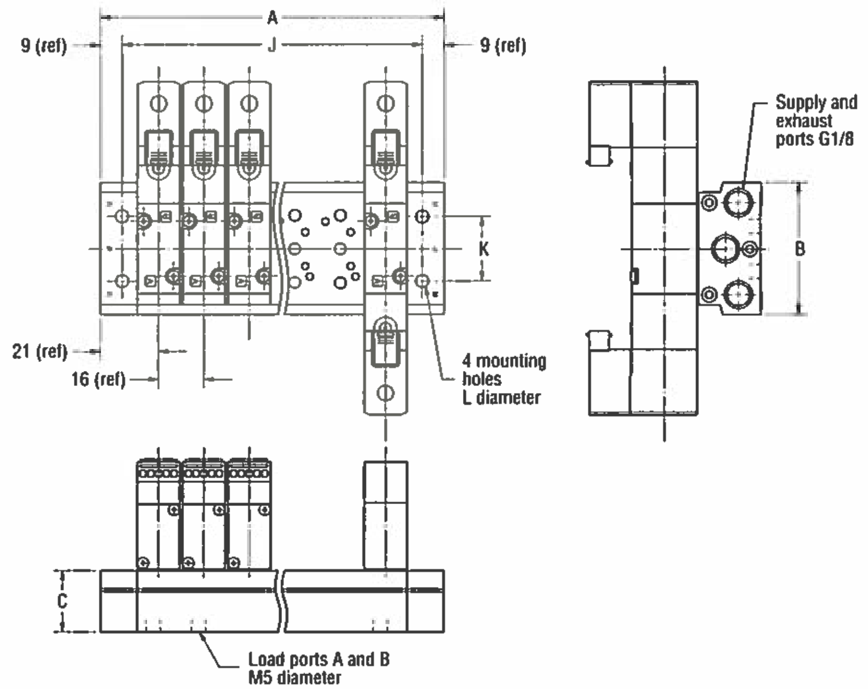
Manifold plates are to be ordered with required number of stations (1 – 20) to suit customers installation requirements.

Notes: *1. Manifold plates include end blocks (1 pair), 'O' rings (6 off) and cap screws (6 off).*
2. Interface gasket (F4-129968) + 2 off valve mounting screws (885541) supplied with valve sub deck (see page KBV 1.2).

Masking plate

For blanking off stations required for future extension.

3. Installation dimensions in mm



A	B	C	J	K	L
N x 16 + 26	47	22	N x 16 + 8	16.5	4.5

N = Number of stations

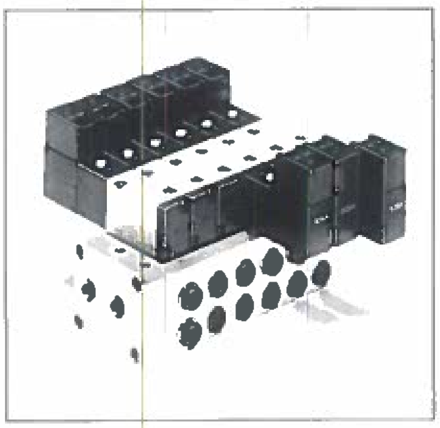
Note: *When operating more than 6 valves simultaneously connect air feed to both ends of manifold plate and keep all exhaust ports open.*

4. Ordering procedure

Order number and type of valves required in accordance with the preferred model selection shown on page KBV 1.2 and the manifold plate to suit installation requirements in accordance with model code shown above plus any masking plates.

CKD Selex spool valves Series M4KB1–H6 manifolds

1/8"BSP common supply and exhaust ports 6mm push-in side ported load ports



1. General description and application benefits

A range of manifold plates of 1 to 20 stations with G1/8" supply and exhaust ports and 6mm push-in side ported load ports for use with the KB1 series of compact sub deck Selex valves.

Manifold plates supplied as sub plate having required number of stations plus end blocks (1 pair) and complete with all required seals, gaskets and mounting screws.

Manifold plate can be surface or 35mm DIN rail (EN 50022) mounted.

Masking plates available for blanking off any stations retained for future extension of system.

- Compact unit for panel installations
- Mixed valve types on one manifold (air/single solenoid/double solenoid)
- Ease of fitting additional valves at future date
- Flexibility of mounting position for valves
- DIN rail mounting option
- Interface plate option

2. Model code and mass

Model code	Description	Mass
V3-850961-H6-**	Manifold plate	0.11kg + 0.05kg per station
M4KA1-MP	Masking plate	0.023kg

*** = Number of stations (1-20) i.e. 6 station manifold plate should be ordered as V3-850961-H6-6.*

Manifold plates

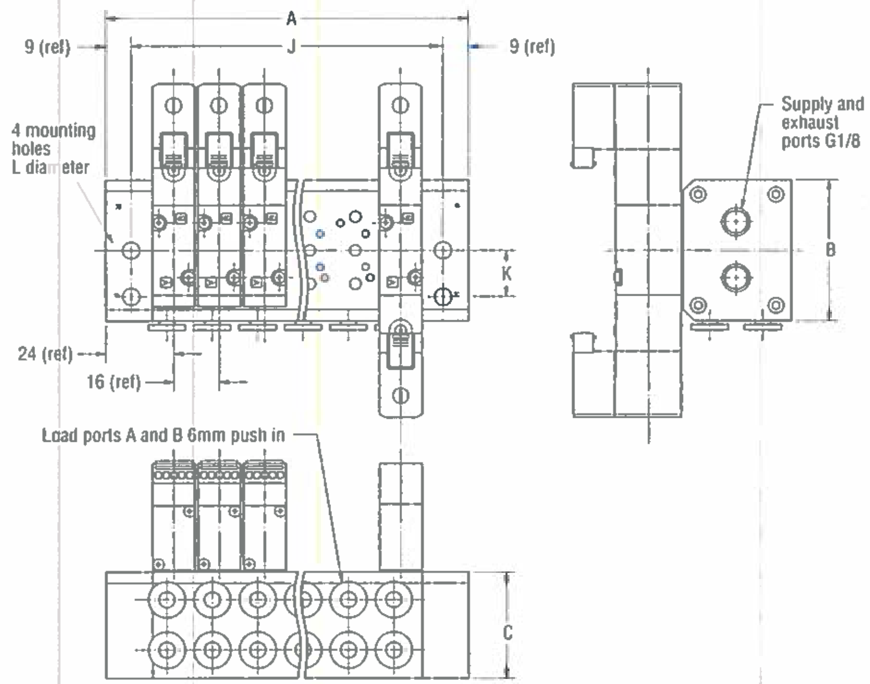
Manifold plates are to be ordered with required number of stations (1 – 20) to suit customers installation requirements.

Notes: *1. Manifold plates include end blocks (1 pair), 'O' rings (4 off) and cap screws (8 off).*
2. Interface gasket (F4-129968) + 2 off valve mounting screws (885541) supplied with valve sub deck (see page KBV 1.2).

Masking plate

For blanking off stations required for future extension.

3. Installation dimensions in mm



A	B	C	J	K	L
N x 16 + 30	45	38	N x 16 + 12	16.5	4.5

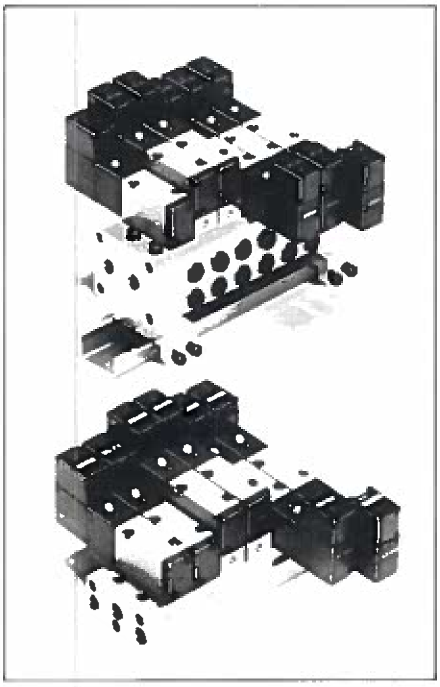
N = Number of stations

Note: *When operating more than 6 valves simultaneously connect air feed to both ends of manifold plate and keep all exhaust ports open.*

4. Ordering procedure

Order number and type of valves required in accordance with the preferred model selection shown on page KBV 1.2 and the manifold plate to suit installation requirements in accordance with model code shown above plus any masking plates.

CKD Selex spool valves Series 4KB1 accessories



1. General description and application benefits

Products for use with 4KB1 series manifold plates and valves

DIN rail mounting plates
Mounting plates which allow M4KB1-H6 series manifold assemblies to be mounted on 35mm DIN rail (EN 50022).

- Additional mounting versatility
- Ideal for control panel applications

Interface plates
Permits independent supply or exhaust connections (M5) to be made to individual stations.

- Individual higher/lower pressure supply
- Individual exhaust for greater control of cylinder speed

Pre wired solenoid lead
Pre wired lead of 3 metre length with sheath protected plug which connects directly into solenoid valve.
Other lengths available on request.

- Saving in installation time.

2. Model code and mass

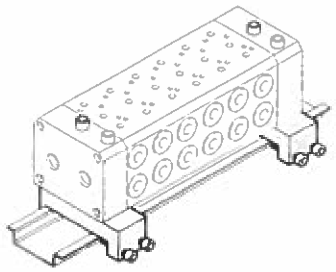
Model code	Description	Mass
M4KA1-DIN	DIN rail mounting plate (pair)	0.082kg
M4KB1-SP	Interface supply plate	0.017kg
M4KB1-EP	Interface exhaust plate	0.017kg
C3-FL3	Pre wired solenoid lead (3m)	0.135kg

DIN rail mounting plates

Supplied as a pair complete with mounting screws (4 off) for fixing to manifold end blocks and for clamping to DIN rail (4 off).

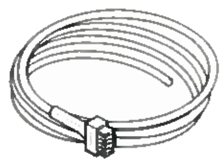
Interface plates
Supplied complete with 1 off interface gasket (F4-129968) and 2 off mounting screws (885606).

DIN rail mounting plate



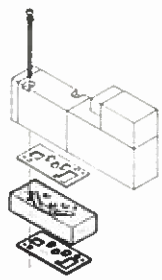
M4KA1-DIN

Pre wired solenoid lead



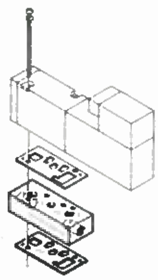
C3-FL3

Interface supply plate



M4KB1-SP

Interface exhaust plate



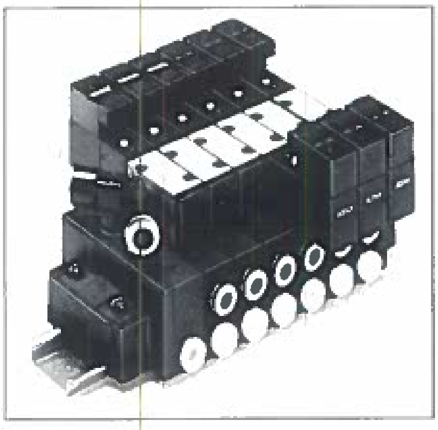
M4KB1-EP

3. Ordering procedure

Order in accordance with model code shown above to suit installation requirements.

CKD Selex spool valves
Series MN4KB1 DIN rail mounting system

4mm, 6mm, 8mm, load ports
⊏⊢ 10, 12, 16, 20, 25, 32, 40mm



1. General description and application benefits

A DIN rail mounted manifold system specially designed for use with the 4KB1 Series solenoid operated range of valves.

- DIN rail mounted (35mm)
- All exhausts collected for environmentally clean applications
- Integral push-in fittings – colour coded
- No limit to number of valves in banks
- Ease of increase or decrease in number of banks
- Choice of piping direction for supply and exhaust
- High heat resistive lightweight sub plates with integral 'O' rings

2. Model code

MN4KB1 Series of DIN rail mounted manifold systems is supplied as individual components for assembly by customer to suit his application requirements.

Valves

Required valves should be ordered in accordance with the preferred model selection shown on page KBV 1.2 (solenoid operated versions only) and will be supplied complete with 2 off mounting screws (885541) and 1 off interface gasket (F4 – 129968) for single sub plate.

The gasket is not required and should be discarded. (Integral gasket is supplied with the DIN rail sub plates).

DIN rail – 35mm (EN 50022)

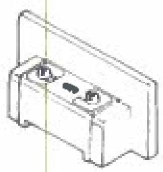
To be supplied by the customer.

Manifold components

A range of 12 components are available as shown below and should be ordered individually to suit the customers installation requirements.

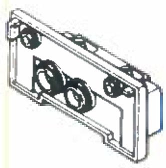
End plates – NE Series

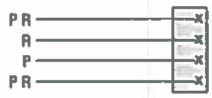
End plate for use on left hand side (load ports A & B of manifold to front)



Port size	Model code
	NE1

End plate for use on right hand side (load ports A & B of manifold to front)

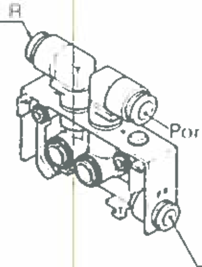


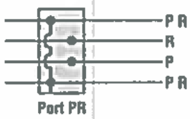


Port size	Model code
	NE2

Supply and exhaust plates – NQ Series

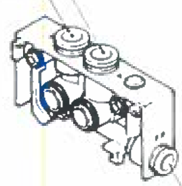
With swivel elbow connections for supply and exhaust ports

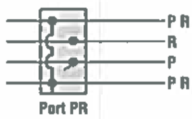




Port sizes P	R	PR	Model code
8mm	8mm	8mm	NQSH8
8mm	8mm	6mm	NQSH886
6mm	8mm	6mm	NQSH686
6mm	6mm	6mm	NQSH6

With straight connections for supply and exhaust ports



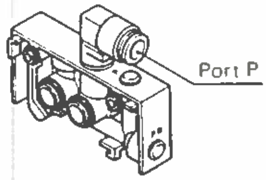


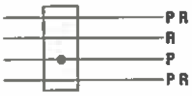
Port sizes P	R	PR	Model code
8mm	8mm	8mm	NQUH8
8mm	8mm	6mm	NQUH886
6mm	8mm	6mm	NQUH686
6mm	6mm	6mm	NQUH6

Note: P = Supply port, R = Exhaust port, PR = Pilot exhaust port

Intermediate supply plates – NP Series

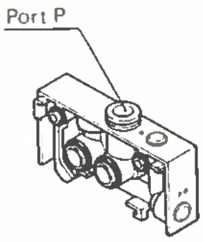
With swivel elbow connections for intermediate supply port

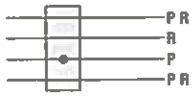




Port size P	Model code
8mm	NPSH8
6mm	NPSH6

With straight connections for intermediate supply port

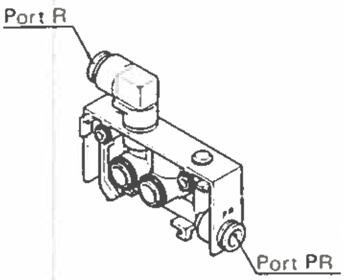


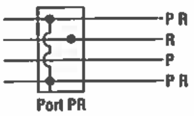


Port size P	Model code
8mm	NPUH8
6mm	NPUH6

Intermediate exhaust plates – NR Series

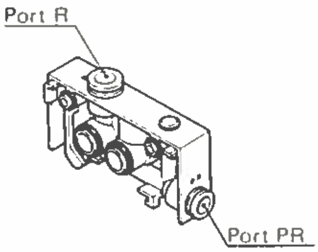
With swivel elbow connections for intermediate exhaust port

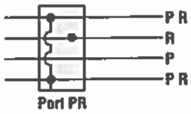




Port sizes R	PR	Model code
8mm	8mm	NRSH8
8mm	6mm	NRSH86
6mm	6mm	NRSH6

With straight connections for intermediate exhaust port

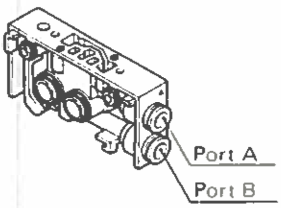


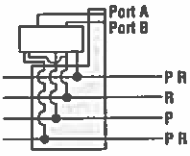


Port sizes R	PR	Model code
8mm	8mm	NRUH8
8mm	6mm	NRUH86
6mm	6mm	NRUH6

DIN rail sub plates – NS Series

For single solenoid valves (includes integral gasket)

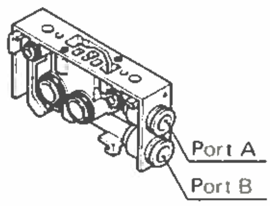


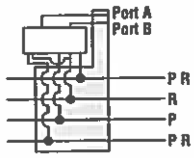


Port sizes A and B	Model code
4mm	NS1SH4
6mm	NS1SH6
8mm	NS1SH8

Spare gaskets F2 – 601338

For double solenoid valves (includes integral gasket)



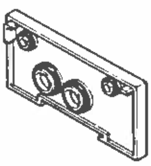


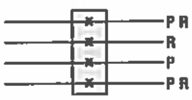
Port sizes A and B	Model code
4mm	NS2SH4
6mm	NS2SH6
8mm	NS2SH8

Spare gaskets F2 – 601231

Blocking plates – NC Series

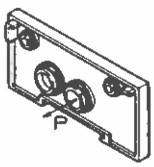
Fully blocked plate to isolate banks of valves

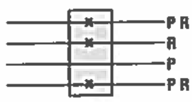




Port size	Model code
	NC1

With exhaust passage only blocked





Port size	Model code
	NC2

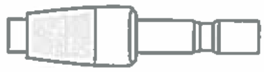
Note: P = Supply port, R = Exhaust port, PR = Pilot exhaust port, A&B = Load ports

Pneumatics

Blanking plugs

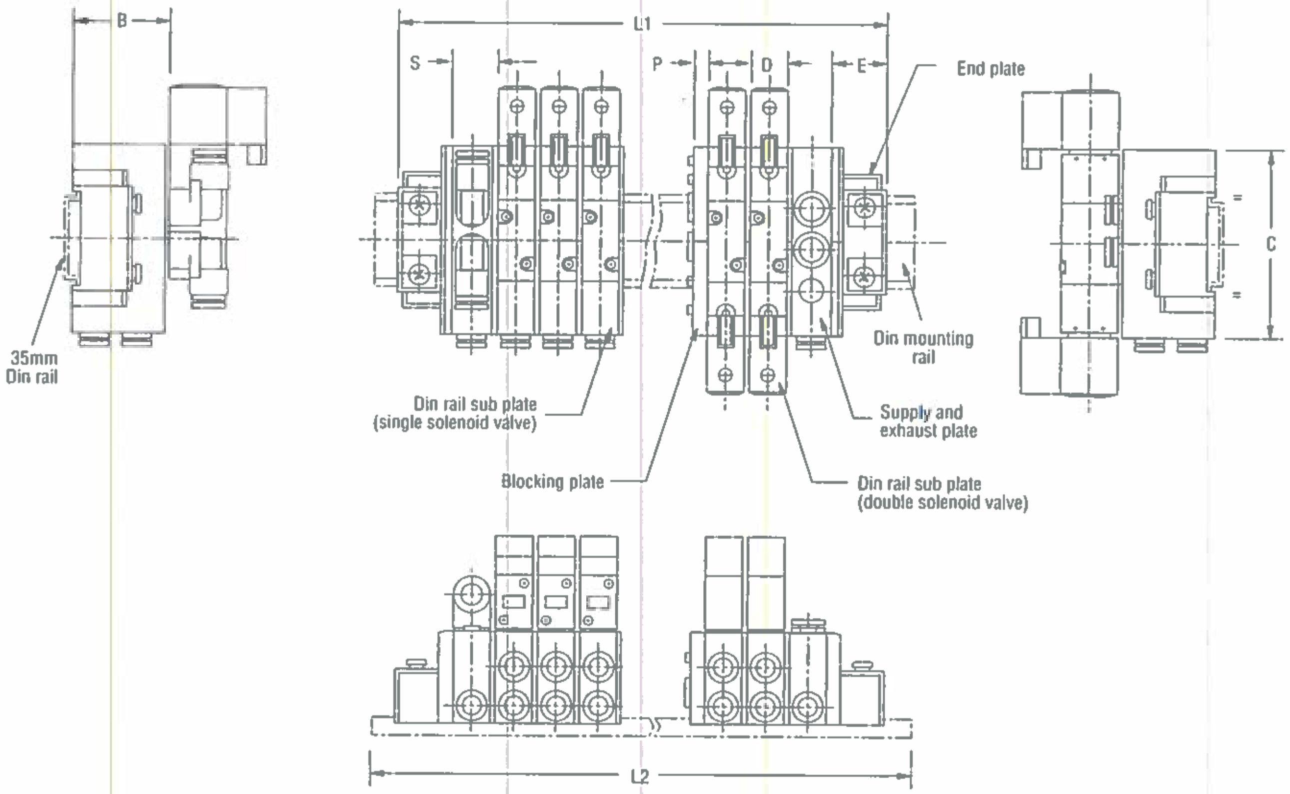
Port size	Model code
4mm	SLM-04BV
6mm	SLM-06BV
8mm	SLM-08BV

Exhaust silencers



Port size	Model code
4mm	PS04P
6mm	PS06P
8mm	PS08P

3. Installation dimensions in mm



B	C	D	E	L1	L2	P	S
39	72	16	20	d x 16 + s x 16 + p x 5 + 40	L1 + 32	5	16

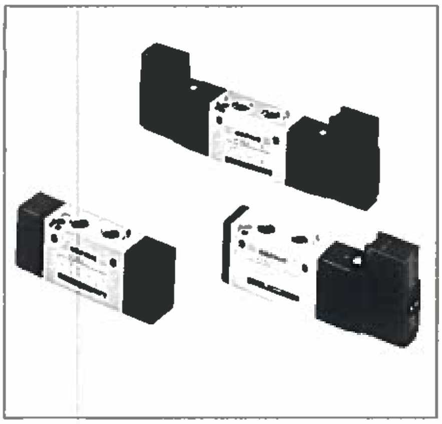
d = Number of DIN rail sub plates
s = Number of supply and exhaust plates / Intermediate supply plates / Intermediate exhaust plates
p = Number of Blocking plates

6. Ordering procedure

Order the number and type of valves required in accordance with the preferred model selection shown on page KBV 1.2. Order required number of DIN rail manifold components in accordance with the relevant model codes shown on pages KBD 1.1-3. These components will be supplied loose for assembly to DIN rail to suit customers application requirements.

CKD Selex spool valves Series 4KA2 body ported

1/8" BSP, 6mm push in - 8mm push-in – 5/2 and 5/3
40, 50, 63, 80, 100mm



1. General description and application benefits

A range of compact 5 port 2 or 3 position directional control spool valves. Solenoid or air operated for the control of double acting cylinders.

- Compact size – only 18mm wide
- Kv = 10.0 (Cv = 0.68)
- Lamp and surge protection
- Low power – 1.8W
- Free standing or manifold mounted
- Lube free
- Manual override as standard
- Pre wired solenoid leads available

2. Model code

4	KA2	*	*	–	*	–	*	* *	*	*
1		2	3		4		5	6	7	8

1 Function
4 = 5 port valve (2 or 3 position).

2 Positions
1 = 2 position, single operation (air or solenoid), spring return.
2 = 2 position, double operation (air or solenoid).
3 = 3 position, double operation (air or solenoid), spring centred, all ports closed.
4 = 3 position, double operation (air or solenoid), spring centred, load ports open to exhaust ports.
5 = 3 position, double operation (air or solenoid), spring centred, load ports open to supply port.

3 Mode of operation
0 = Solenoid operated
1 = Air operated

4 Pipe size
06G = G$^1/_8$"
GS6† = 6mm push-in fitting. (part No ZH-061)
GS8† = 8mm push-in fitting. (part No ZH-081)

5 Manual override
No mark = Non lock type.

6 Wiring
C3 = C type connector with surge killer and lamp.
B† = Small terminal box. (part No 885548)

7 Options
No mark = Without mounting plate.
P† = With mounting plate (part No 4KA2–P)

8 Voltage
KZ= 24v DC
RY= 110v AC 50/60Hz
SY= 220v AC 50/60Hz
JZ = 12v DC (option)

Note: 1) † The features shown are offered as standard variants – see section 4 on page KAV 2.2 for details of method of supply.
2) For preferred model selection see section 3 on page KAV 2.2

3. Preferred model selection and mass

The products listed represent the standard product range most readily available

4KA2 Series – Solenoid operated 5/2 and 5/3

Model code	Symbol	Description	Mass
4KA210 – 06G – C3**		5 port, 2 position, solenoid pilot actuated, spring return.	0.145kg
4KA220 – 06G – C3**		5 port, 2 position, solenoid pilot actuated at both ends.	0.215kg
4KA230 – 06G – C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, all ports closed.	0.230kg
4KA240 – 06G – C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to exhaust ports.	0.230kg
4KA250 – 06G – C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to supply port.	0.230kg

4KA1 Series – Air operated 5/2 and 5/3

Model code	Symbol	Description	Mass
4KA211 – 06G		5 port, 2 position, air actuated, spring return.	0.069kg
4KA221 – 06G		5 port, 2 position, air actuated at both ends.	0.084kg
4KA231 – 06G		5 port, 3 position, spring centred, air actuated at both ends, all ports closed.	0.101kg
4KA241 – 06G		5 port, 3 position, spring centred, air actuated at both ends, load ports open to exhaust ports.	0.101kg
4KA251 – 06G		5 port, 3 position, spring centred, air actuated at both ends, load ports open to supply port.	0.101kg

Note: 1) Graphical symbols ref ISO 1219 (BS 2917)
*2) ** = Solenoid voltage code – to be specified (see position* [8] *on page KAV 2.1)*

4. Standard variants

[4] **Pipe size**

GS6 = 6mm push-in fitting — Will be supplied as standard valve with required number of fittings ref **ZH-061** provided loose for fitting by customer.

GS8 = 8mm push-in fitting — Will be supplied as standard valve with required number of fittings ref **ZH-081** provided loose for fitting by customer.

[6] **Wiring**

B = Small terminal box — Achieved by removing existing connector as supplied and fitting miniature DIN plug and sealing washer ref 885548 which will be supplied loose.

[7] **Options**

P = Mounting plate — To be ordered separately (part number 4KA2–P)

5. Non standard variants

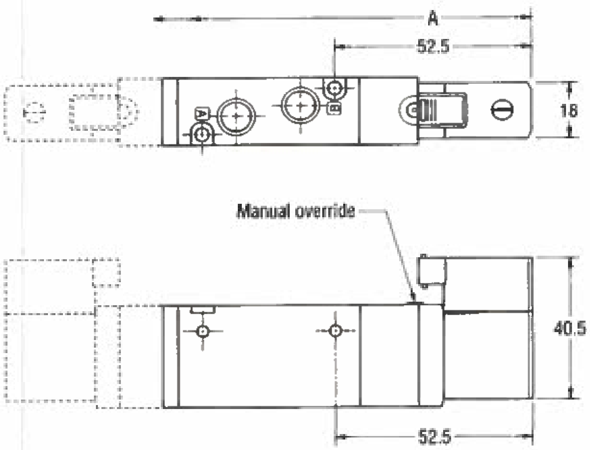
All other catalogued variants will be available **to special order only.**

6. Operating data

Flow factors to ISO 6358 (BS 7294)	Kv = 10.0 (Cv = 0.68)
Minimum pilot air pressure at 6.3 bar (90 psig) body pressure	2 position valves 1.5 bar (21.8 psig) 3 position valves 2.0 bar (29.0 psig)
Maximum operating pressure	7 bar (101.5 psig)
Operating media	Compressed air or inert gas
Media operating temperature	+5°C to +60°C (41°F to 140°F)
Ambient operating temperature	–10°C to +60°C (15°F to 140°F)
Response times	2 position valves – less than 20 milliseconds 3 position valves – less than 30 milliseconds
Cycling rate at 6.3 bar (90 psig)	240 cycles per minute at 20°C (68°F) ambient
Type of connection	Main ports – Screwthread body ported G $^1/_8$" Pilot ports – Screwthread body ported M5
Type of lubricant	Non lube therefore not essential but if installed in lubricated system use ISO VG37 mineral oil
Solenoid coils	Class B moulded coil Voltage tolerance +10% to –10% Coil consumption at nominal voltage and 20°C (68°F) – 1.8W Surge protection and indicator lamp standard
Service kits	

7. Installation dimensions in mm

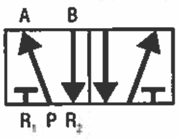
Solenoid operated versions



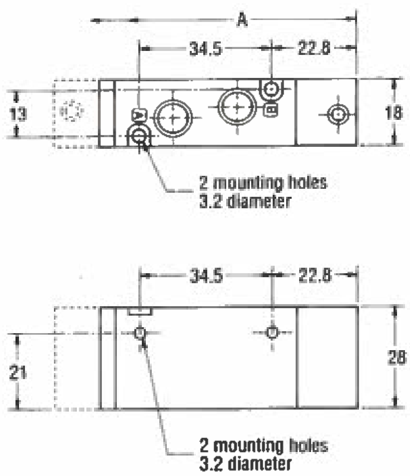
Main ports G1/8"

Model code	A
4KA210	98
4KA220	140
4KA230, 4KA240, 4KA250	154.5

Porting configuration



Air operated versions



Main ports G1/8"
Pilot ports M5

Model code	A
4KA211	68.3
4KA221	80.6
4KA231, 4KA241, 4KA251	95.1

8. Ordering procedure

Preferred models

Order as preferred model selection.

** When ordering solenoid operated versions ensure solenoid voltage code is added to model code.

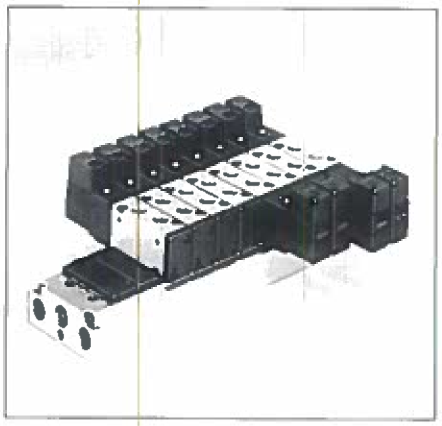
Standard variants

Typical model code:- **4KA220 – GS6 – BPRY**

Will be supplied as:- **4KA220 – 06G – C3RY** valve with
3 off **ZH-061** push-in fittings
2 off **885548** miniature DIN plugs
and 1 off **4KA2 – P** mounting plate

CKD Selex spool valves Series M4KA2 manifolds

1/4"BSP common supply and exhaust ports



1. General description and application benefits

A range of manifold plates of 1 to 20 stations with G1/4" supply and exhaust ports for use with the KA2 Series of compact body ported Selex valves.

Manifold plates supplied as sub plate having required number of stations plus end blocks (1 pair) and complete with all required seals, gaskets and mounting screws.

Masking plates available for blanking off any stations retained for future extension of system.

- Compact unit for panel installations
- Mixed valve types on one manifold (air/single solenoid/double solenoid)
- Ease of fitting additional valves at future date
- Flexibility of mounting position for valves
- DIN rail mounting option
- Interface plate options

2. Model code and mass

Model code	Description	Mass
V2-603467-**	Manifold plate	0.125kg + 0.062kg per station
M4KA2-MP	Masking plate	0.030kg

*** = Number of stations (1-20) i.e. 10 station manifold plate should be ordered as V2-603467-10.*

Manifold plates

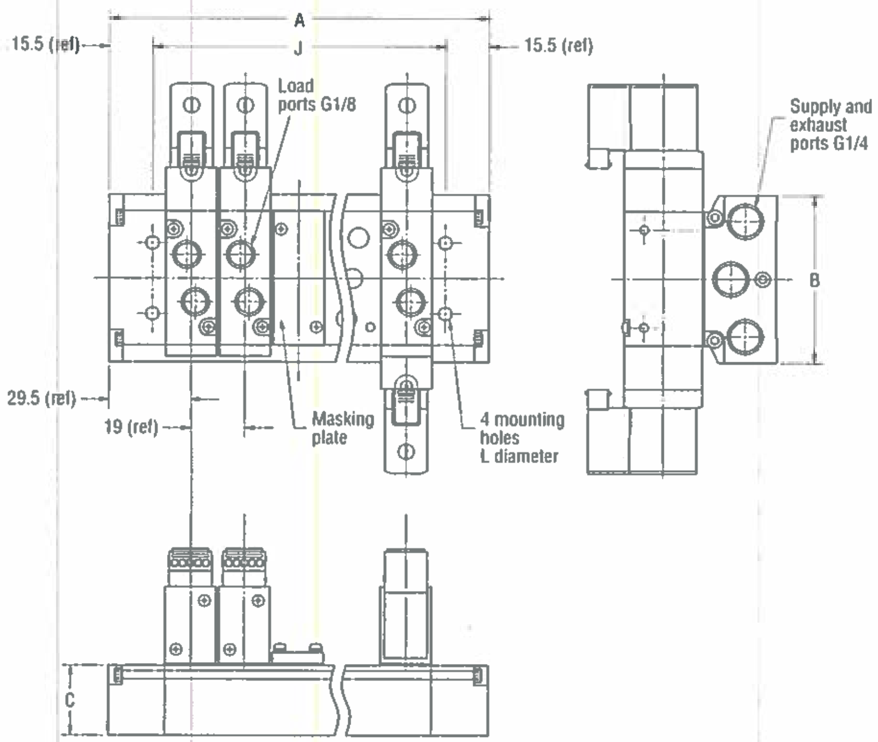
Manifold plates are to be ordered with required number of stations (1 – 20) to suit customers installation requirements.

***Note:** Manifold plates include end blocks (1 pair), 'O' rings (6 off), cap screws (6 off) and 1 off interface gasket (F4-603243) plus 2 off valve mounting screws (885542) per station.*

Masking plate

For blanking off stations required for future extension.

3. Installation dimensions in mm



A	B	C	J	K	L
N x 19 + 40	60	26	N x 19 + 9	21	4.5

N = Number of stations

***Note:** When operating more than 6 valves simultaneously connect air feed to both ends of manifold plate and keep all exhaust ports open.*

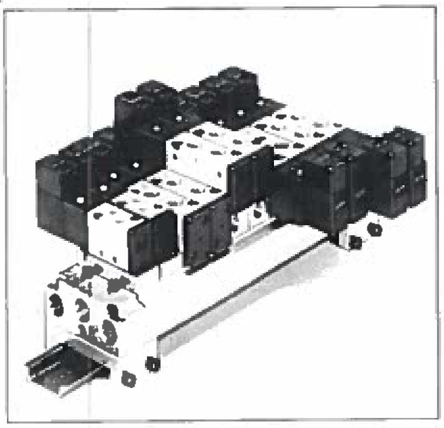
4. Ordering procedure

Order number and type of valves required in accordance with the preferred model selection shown on page KAV 2.2 and the manifold plate to suit installation requirements in accordance with model code shown above plus any masking plates.

VICKERS

Pneumatics

CKD Selex spool valves
Series 4KA2 accessories



1. General description and application benefits

Products for use with 4KA2 series manifold plates and valves.

DIN rail mounting plates
Mounting plates which allow M4KA2 series manifold assemblies to be mounted on 35mm DIN rail (EN 50022).

- Additional mounting versatility
- Ideal for control panel applications

Interface plates
Permits independent supply or exhaust connections (G1/8") to be made to individual stations.

- Individual higher/lower pressure supply
- Individual exhaust for greater control of cylinder speed

Adaptor plate
Allows 4KA1 series valves to be mounted to 4KA2 series manifold plates

- Common manifold for mixed valve types
- Neatness of installation

Pre wired solenoid lead
Pre wired lead of 3 metre length with sheath protected plug which connects directly into solenoid valve.
Other lengths available on request.

- Saving in installation time.

2. Model code and mass

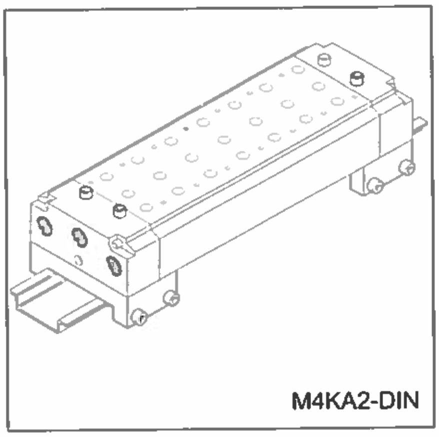
Model code	Description	Mass
M4KA2-DIN	DIN rail mounting plates (pair)	0.137kg
M4KA2-SP	Interface supply plate	0.033kg
M4KA2-EP	Interface exhaust plate	0.033kg
M4KA2-AP	Adaptor plate 4KA2 to 4KA1	0.021kg
C3-FL3	Pre wired solenoid Lead (3m)	0.135kg

DIN rail mounting plates
Supplied as a pair complete with mounting screws (4 off) for fixing to manifold end blocks and for clamping to DIN rail (4 off).

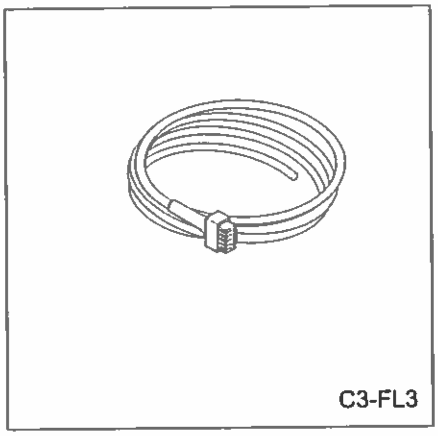
Interface plates
Supplied complete with 1 off interface gasket (F4-603243) and 2 off mounting screws (885605).

Adaptor plate
Supplied complete with 1 off interface gasket (F4-129968), 2 off mounting screws (885607) and 2 off mounting screws (885541).

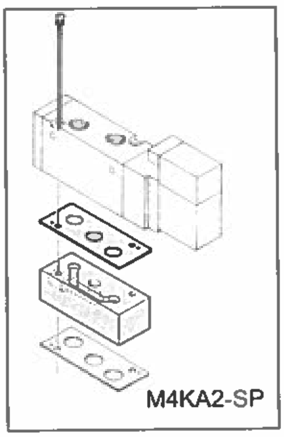
DIN rail mounting plate



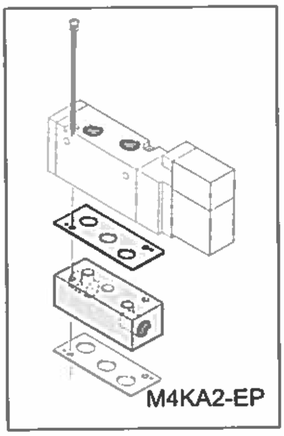
Pre wired solenoid lead



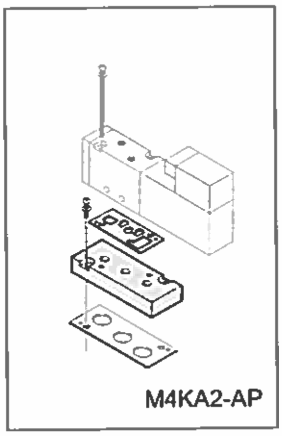
Interface supply plate



Interface exhaust plate



Adaptor plate



3. Ordering procedure

Order in accordance with model code shown above to suit installation requirements.

VICKERS

Pneumatics

CKD Selex spool valves
Series 4KB2 sub plate or manifold mounting

1/8" BSP, 1/4"BSP – 5/2 and 5/3
40, 50, 63, 80, 100mm

1. General description and application benefits

A range of compact 5 port 2 or 3 position directional control spool valves. Solenoid or air operated for the control of double acting cylinders.

- Compact size – only 15mm wide
- Kv = 11.0 (Cv = 0.76)
- Lamp and surge protection
- Low power – 1.8W
- Sub plate or DIN rail mounted
- Lube free
- Manual override as standard
- Pre wired solenoid leads available

2. Model code

4	KB2	*	*	–	*	–	*	* *	*	*
1		2	3		4		5	6	7	8

1 Function
4 = 5 port valve
(2 or 3 position).

2 Positions
1 = 2 position, single operation (air or solenoid), spring return.
2 = 2 position, double operation (air or solenoid).
3 = 3 position, double operation (air or solenoid), spring centred, all ports closed.
4 = 3 position, double operation (air or solenoid), spring centred, load ports open to exhaust ports.
5 = 3 position, double operation (air or solenoid), spring centred, load ports open to supply port.

3 Mode of operation
8 = Air operated
9 = Solenoid operated

4 Pipe size
No mark = Valve only (sub plate to be ordered separately)

5 Manual override
No mark = Non lock type.

6 Wiring
C3 = C type connector with surge killer and lamp.
B† = Small terminal box (part No 885548)

7 Options
No mark = Standard valve

8 Voltage
KZ= 24v DC
RY= 110v AC 50/60Hz
SY= 220v AC 50/60Hz
JZ = 12v DC (option)

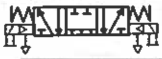
Note: 1) † The feature shown is offered as a standard variant – see section 4 on page KBV 2.2 for details of method of supply.
2) For preferred model selection see section 3 on page KBV 2.2

3. Preferred model selection and mass

The products listed represent the standard product range most readily available

Note: *Valves are supplied as sub-decks complete with 2 off mounting screws (885542) and 1 off interface gasket (F4–603243) for mounting to single sub plates, manifold plates or DIN rail mounted sub plates.*

4KB2 Series – Solenoid operated 5/2 and 5/3

Model code	Symbol	Description	Mass
4KB219–C3**		5 port, 2 position, solenoid pilot actuated, spring return.	0.139kg
4KB229–C3**		5 port, 2 position, solenoid pilot actuated at both ends.	0.219kg
4KB239–C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, all ports closed.	0.237kg
4KB249–C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to exhaust ports.	0.237kg
4KB259–C3**		5 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to supply port.	0.237kg

4KB2 Series – Air operated 5/2 and 5/3

Model code	Symbol	Description	Mass
4KB218		5 port, 2 position, air actuated, spring return.	0.075kg
4KB228		5 port, 2 position, air actuated at both ends.	0.090kg
4KB238		5 port, 3 position, spring centred, air actuated at both ends, all ports closed.	0.108kg
4KB248		5 port, 3 position, spring centred, air actuated at both ends, load ports open to exhaust ports.	0.108kg
4KB258		5 port, 3 position, spring centred, air actuated at both ends, load ports open to supply port.	0.108kg

Note: *1) Graphical symbols ref ISO 1219 (BS 2917)*
*2) ** = Solenoid voltage code – to be specified (see position* [8] *on page KBV 2.1)*

4. Standard variant

[6] **Wiring**
B= Small terminal box — Achieved by removing existing connector as supplied and fitting miniature DIN plug and sealing washer ref 885548 which will be supplied loose.

5. Non standard variants

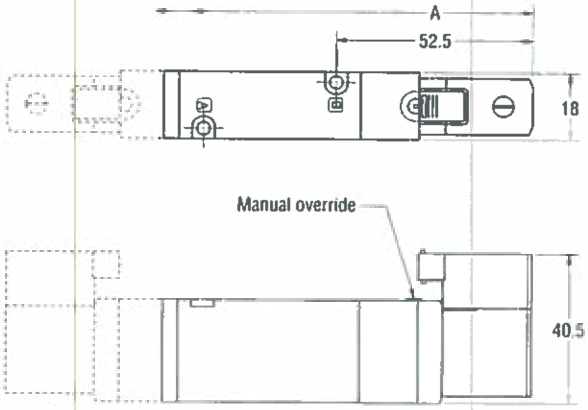
All other catalogued variants will be available **to special order ONLY.**

6. Operating data

Flow factors to ISO 6358 (BS 7294)	Kv = 11.0 (Cv = 0.76)
Minimum pilot air pressure at 6.3 bar (90 psig) body pressure	2 position valves 1.5 bar (21.8 psig) 3 position valves 2.0 bar (29.0 psig)
Maximum operating pressure	7 bar (101.5 psig)
Operating media	Compressed air or inert gas
Media operating temperature	+5°C to +60°C (41°F to 140°F)
Ambient operating temperature	–10°C to +60°C (15°F to 140°F)
Response times	2 position valves – less than 20 milliseconds 3 position valves – less than 30 milliseconds
Cycling rate at 6.3 bar (90 psig)	240 cycles per minute at 20°C (68°F) ambient
Type of connection	Sub plate or manifold plate mounted
Type of lubricant	Non lube therefore not essential but if installed in lubricated system use ISO VG37 mineral oil
Solenoid coils	Class B moulded coil Voltage tolerance +10% to –10% Coil consumption at nominal voltage and 20°C (68°F) – 1.8W Surge protection and indicator lamp standard
Service kits	

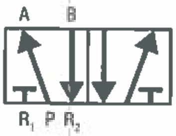
7. Installation dimensions in mm

Solenoid operated versions

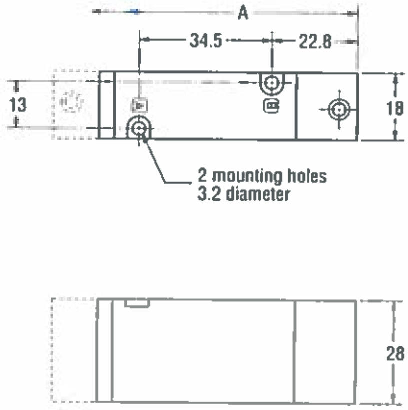


Model code	A
4KB219	98
4KB229	140
4KB239, 4KB249, 4KB259	154.5

Porting configuration



Air operated versions



Pilot ports M5

Model code	A
4KB218	68.3
4KB228	80.6
4KB238, 4KB248, 4KB258	95.1

8. Ordering procedure

Preferred models

Order as preferred model selection.

** When ordering solenoid operated versions ensure solenoid voltage code is added to model code.

Standard variant

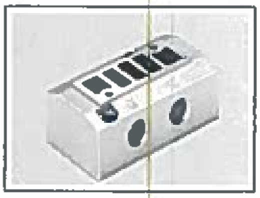
Typical model code:- **4KB229 – BRY**

Will be supplied as:- **4KB229 – C3RY** valve with

2 off **885548** miniature DIN plugs

CKD Selex valves
Series 4KB2 single sub plate

1/8", 1/4"BSP



1. General description and application benefits

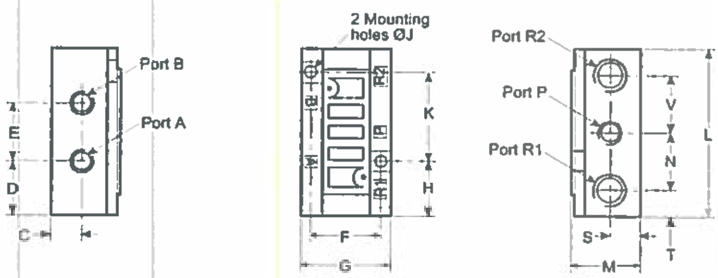
Single sub plate for use with 4KB2 series valves.

G1/8" or G1/4" supply and load ports, G1/4" exhaust ports.

2. Model code and mass

Size	Model	Mass
G1/8"	4KB2 - 06G	0.090kg
G1/4"	4KB2 - 08G	0.080kg

3. Installation dimensions in mm



Model	Ports A&B	C	D	E	F	G	H	J	K	L	M	N	Port P	Ports R1&R2	S	T	V
4KB2-06G	G1/8"	11.5	21	22	27	34	21	4.3	34	64	26	22	G1/8"	G1/4"	11.5	10	22
4KB2-08G	G1/4"	11.5	21	22	27	34	21	4.3	34	64	26	22	G1/4"	G1/4"	11.5	10	22

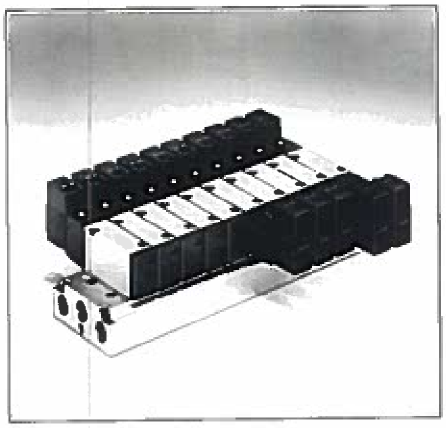
4. Ordering procedure

Order in accordance with model code shown.

Pneumatics

CKD Selex spool valves Series M4KB2 manifolds

1/4"BSP common supply and exhaust ports 1/8"BSP base ported load ports



1. General description and application benefits

A range of manifold plates of 1 to 20 stations with G1/4" supply and exhaust ports and G1/8" base ported load ports for use with the KB2 Series of compact sub deck Selex valves.

Manifold plates supplied as sub plate having required number of stations plus end blocks (1 pair) and complete with all required seals, gaskets and mounting screws.

Masking plates available for blanking off any stations retained for future extension of system.

- Compact unit for panel installations
- Mixed valve types on one manifold (air/single solenoid/double solenoid)
- Ease of fitting additional valves at future date
- Flexibility of mounting position for valves
- Interface plate options

2. Model code and mass

Model code	Description	Mass
V2-603652-**	Manifold plate	0.05kg + 0.036kg per station
M4KA1-MP	Masking plate	0.023kg

*** = Number of stations (1-20) i.e. 10 station manifold plate should be ordered as V2-603652-10*

Manifold plates

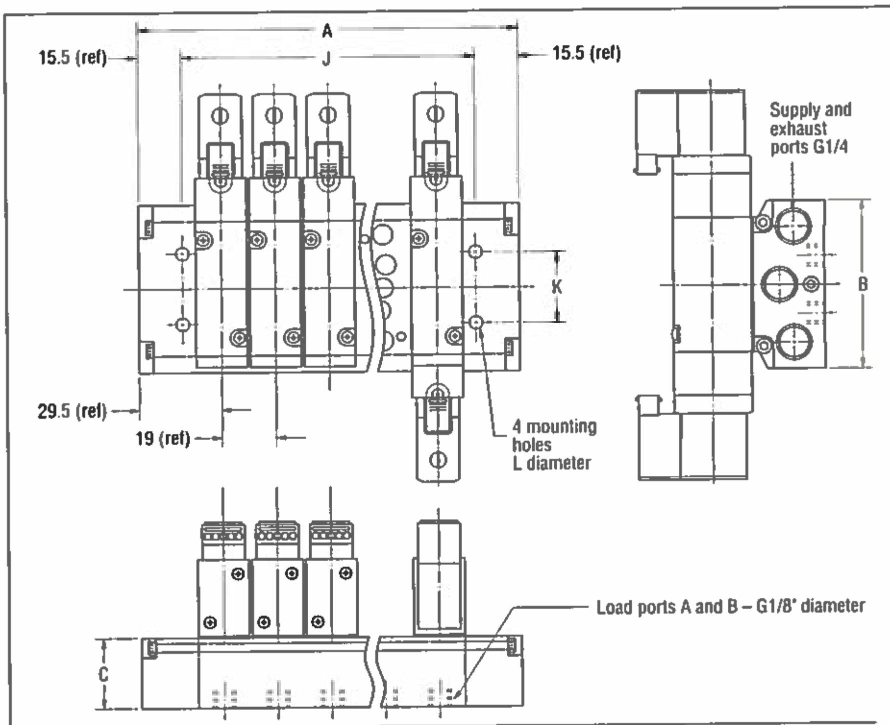
Manifold plates are to be ordered with required number of stations (1 – 20) to suit customers installation requirements.

Notes: *1. Manifold plates include end blocks (1 pair), 'O' rings (6 off) and cap screws (6 off).*
2. Interface gasket (F4-603244) + 2 off valve mounting screws (885542) supplied with valve sub deck (see page KBV 2.2).

Masking plate

For blanking off stations required for future extension.

3. Installation dimensions in mm



A	B	C	J	K	L
N x 19 + 40	60	26	N x 19 + 9	21	4.5

N = Number of stations

Note: *When operating more than 6 valves simultaneously connect air feed to both ends of manifold plate and keep all exhaust ports open.*

4. Ordering procedure

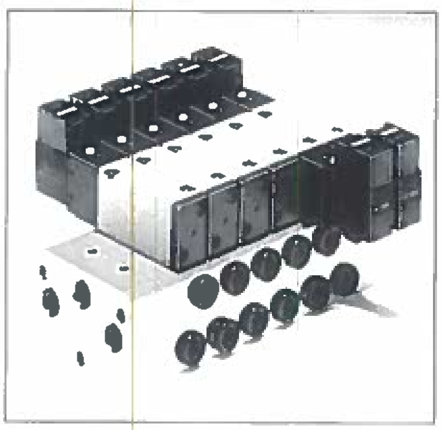
Order number and type of valves required in accordance with the preferred model selection shown on page KBV 2.2 and the manifold plate to suit installation requirements in accordance with model code shown above plus any masking plates.

VICKERS

Pneumatics

CKD Selex spool valves
Series M4KB2–H6, M4KB2–H8 manifolds

1/4" BSP common supply and exhaust ports
6mm push-in, 8mm push-in side ported load ports



1. General description and application benefits

A range of manifold plates of 1 to 20 stations with G1/4" supply and exhaust ports and 6mm or 8mm push-in side ported load ports for use with the KB2 series of compact sub deck Selex valves.

Manifold plates supplied as sub plate having required number of stations plus end blocks (1 pair) and complete with all required seals, gaskets and mounting screws.

Manifold plate can be surface or 35mm DIN rail (EN 50022) mounted.

Masking plates available for blanking off any stations retained for future extension of system.

- Compact unit for panel installations
- Mixed valve types on one manifold (air/single solenoid/double solenoid)
- Ease of fitting additional valves at future date
- Flexibility of mounting position for valves
- DIN rail mounting option
- Interface plate options

2. Model code and mass

Model code	Description	Mass
V3-821203-H6-**	6mm Manifold plate	0.25kg + 0.11kg per station
V3-821203-H8-**	8mm Manifold plate	0.25kg + 0.10kg per station
M4KA1-MP	Masking plate	0.023kg

*** = Number of stations (1-20) i.e. 6 station manifold plate with 8mm push-in fittings should be ordered as V3-821203-H8-6.*

Manifold plates

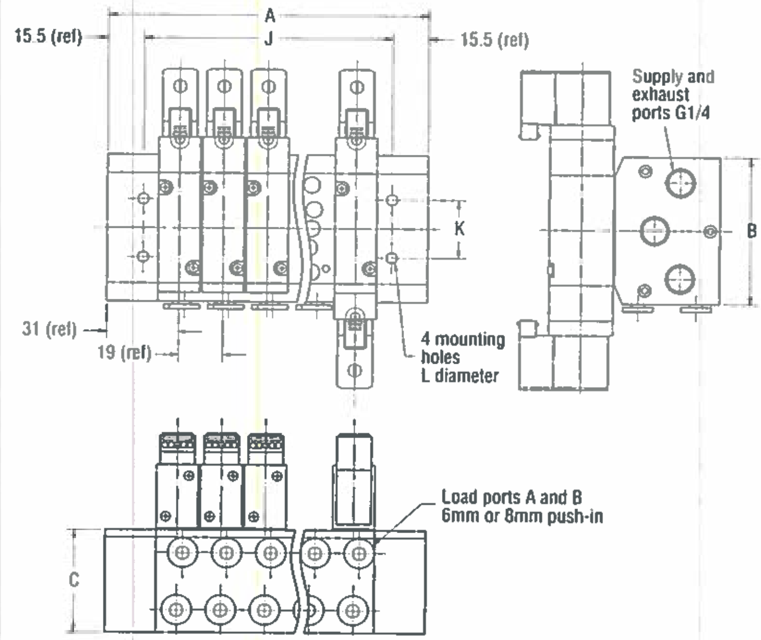
Manifold plates are to be ordered with required number of stations (1 – 20) to suit customers installation requirements.

Notes: *1. Manifold plates include end blocks (1 pair), 'O' rings (6 off) and cap screws (6 off).*
2. Interface gasket (F4-603244) + 2 off valve mounting screws (885542) supplied with valve sub deck (see page KBV 2.2).

Masking plate

For blanking off stations required for future extension.

3. Installation dimensions in mm



A	B	C	J	K	L
N x 19 + 40	64	45	N x 19 + 9	21	4.5

N = Number of stations

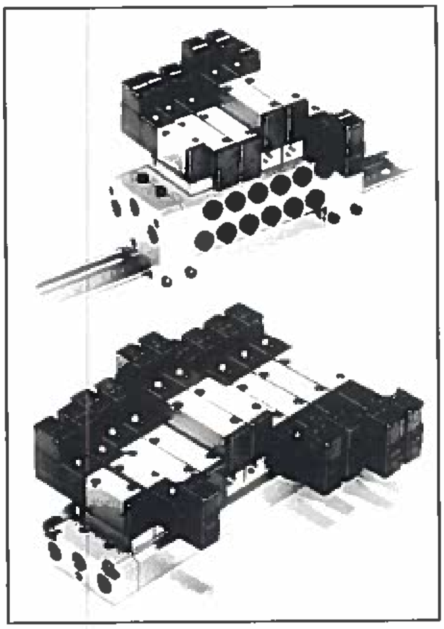
***Note:** When operating more than 6 valves simultaneously connect air feed to both ends of manifold plate and keep all exhaust ports open.*

4. Ordering procedure

Order number and type of valves required in accordance with the preferred model selection shown on page KBV 2.2 and the manifold plate to suit installation requirements in accordance with model code shown above plus any masking plates.

Pneumatics

CKD Selex spool valves
Series 4KB2 accessories



1. General description and application benefits

Products for use with M4KB2 series manifold plates:

DIN rail mounting plates
Mounting plates which allow M4KB2-H6 and M4KB2-H8 series manifold assemblies to be mounted on 35mm DIN rail (EN50022).

- Additional mounting versatility
- Ideal for control panel applications

Interface plates
Permits independent supply or exhaust connections (G1/8") to be made to individual stations.

- Individual higher/lower pressure supply
- Individual exhaust for greater control of cylinder speed

Adaptor plate
Allows 4KB1 series valves to be mounted to 4KB2 series manifold plates

- Common manifold for mixed valve types
- Neatness of installation

Pre wired solenoid lead
Pre wired lead of 3 metre length with sheath protected plug which connects directly into solenoid valve.
Other lengths available on request.

- Saving in installation time.

2. Model code and mass

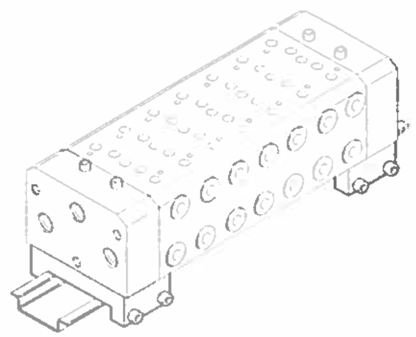
Model code	Description	Mass
M4KA2-DIN	DIN rail mounting plates (pair)	0.137kg
M4KB2-SP	Interface supply plate	0.033kg
M4KB2-EP	Interface exhaust plate	0.033kg
M4KB2-AP	Adaptor plate 4KB2 to 4KB1	0.021kg
C3-FL3	Pre wired solenoid lead (3m)	0.135kg

DIN rail mounting plates
Supplied as a pair complete with mounting screws (4 off) for fixing to manifold end blocks and for clamping to DIN rail (4 off).

Interface plates
Supplied complete with 1 off interface gasket (F4-603244) and 2 off mounting screws (885605).

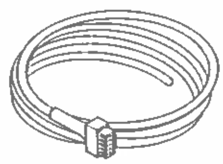
Adaptor plates
Supplied complete with 1 off interface gasket (F4-603244) and 2 off mounting screws (885607).

DIN rail mounting plate



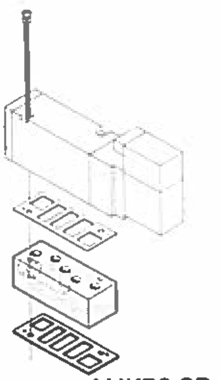
M4KA2-DIN

Pre wire solenoid lead



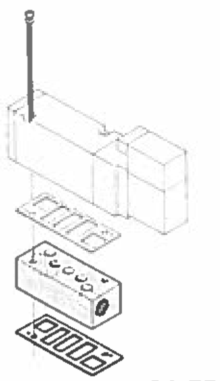
C3-FL3

Interface supply plate



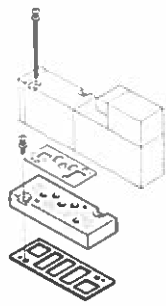
M4KB2-SP

Interface exhaust plate



M4KB2-EP

Adaptor plate



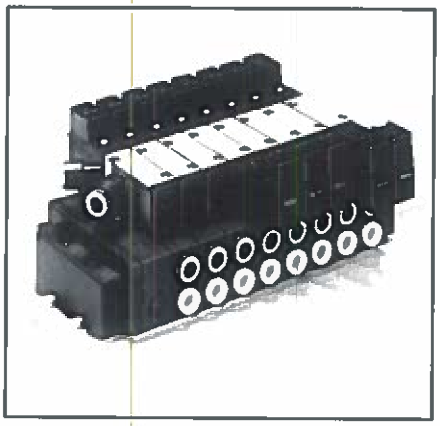
M4KB2-AP

3. Ordering procedure

Order in accordance with model code shown above to suit installation requirements.

CKD Selex spool valves
Series MN4KB2 DIN rail mounting system

6mm, 8mm, 10mm load ports
40, 50, 63, 80, 100mm



1. General description and application benefits

A DIN rail mounted manifold system specially designed for use with the 4KB2 Series solenoid operated range of valves.

- DIN rail mounted (35mm)
- All exhausts collected for environmentally clean applications
- Integral push-in fittings – colour coded
- No limit to number of valves in banks
- Ease of increase or decrease in number of banks
- Choice of piping direction for supply and exhaust
- High heat resistive lightweight sub plates with integral 'O' rings
- Ideal for control panels

2. Model code

MN4KB2 Series of DIN rail mounted manifold systems is supplied as individual components for assembly by customer to suit his application requirements.

Valves

Required valves should be ordered in accordance with the preferred model selection shown on page KBV 2.2 (solenoid operated versions only) and will be supplied complete with 2 off mounting screws (885542) and 1 off interface gasket (F4 – 603243) for single sub plate.

The gasket is not required and should be discarded. (Integral gasket is supplied with the DIN rail sub plates).

DIN rail – 35mm (EN 50022)

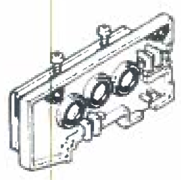
To be supplied by the customer.

Manifold components

A range of 12 components are available as shown below and should be ordered individually to suit the customers installation requirements.

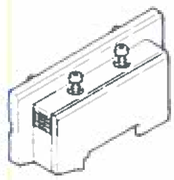
End plates – NE Series

End plate for use on left hand side (load ports A & B of manifold to front)



Port size	Model code
	2NE1

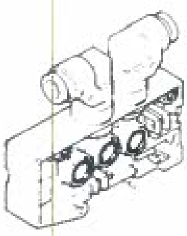
End plate for use on right hand side (load ports A & B of manifold to front)

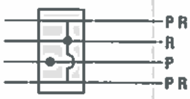


Port size	Model code
	2NE2

Supply and exhaust plates – NQ Series

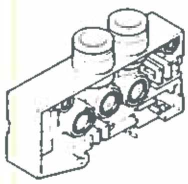
With swivel elbow connections for supply and exhaust ports

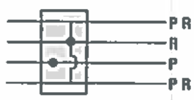




Port sizes P	Port sizes R	Model code
12mm	12mm	2NQSH12
10mm	10mm	2NQSH10
8mm	8mm	2NQSH8

With straight connections for supply and exhaust ports



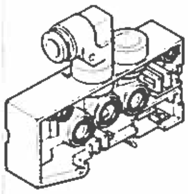


Port sizes P	Port sizes R	Model code
12mm	12mm	2NQUH12
10mm	10mm	2NQUH10
8mm	8mm	2NQUH8

Note: P = Supply port, R = Exhaust port, PR = Pilot exhaust

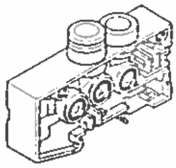
Intermediate supply plates – NP Series

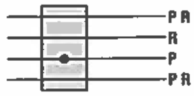
With swivel elbow connections for intermediate supply port



Port size P	Model code
12mm	2NPSH12
10mm	2NPSH10
8mm	2NPSH8

With straight connections for intermediate supply port

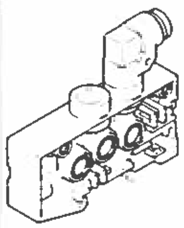


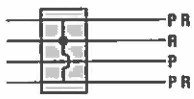


Port size P	Model code
12mm	2NPUH12
10mm	2NPUH10
8mm	2NPUH8

Intermediate exhaust plates – NR Series

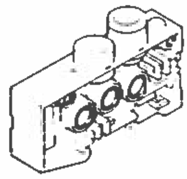
With swivel elbow connections for intermediate exhaust port

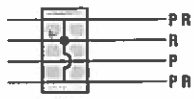




Port size P	Model code
12mm	2NRSH12
10mm	2NRSH10
8mm	2NRSH8

With straight connections for intermediate exhaust port

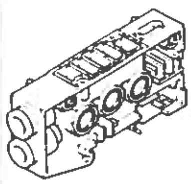


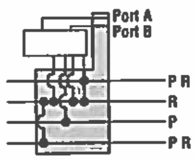


Port size P	Model code
12mm	2NRUH12
10mm	2NRUH10
8mm	2NRUH8

DIN rail sub plates – NS Series

For single solenoid valves (includes integral gasket)

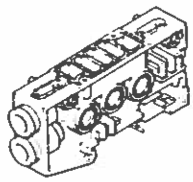


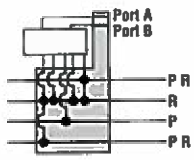


Port size A and B	Model code
10mm	2NS1SH10
8mm	2NS1SH8
6mm	2NS1SH6

Spare gaskets F2 – 603703

For double solenoid valves (includes integral gasket)



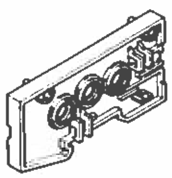


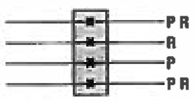
Port size A and B	Model code
10mm	2NS2SH10
8mm	2NS2SH8
6mm	2NS2SH6

Spare gaskets F2 – 603704

Blocking plates – NC Series

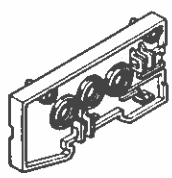
Fully blocked plate to isolate banks of valves

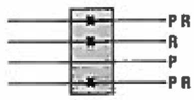




Port size	Model code
	2NC1

With exhaust passage only blocked





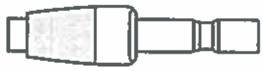
Port size	Model code
	2NC2

***Note:** P = Supply port, R = Exhaust port, PR = Pilot exhaust, A&B = Load ports*

Blanking plugs

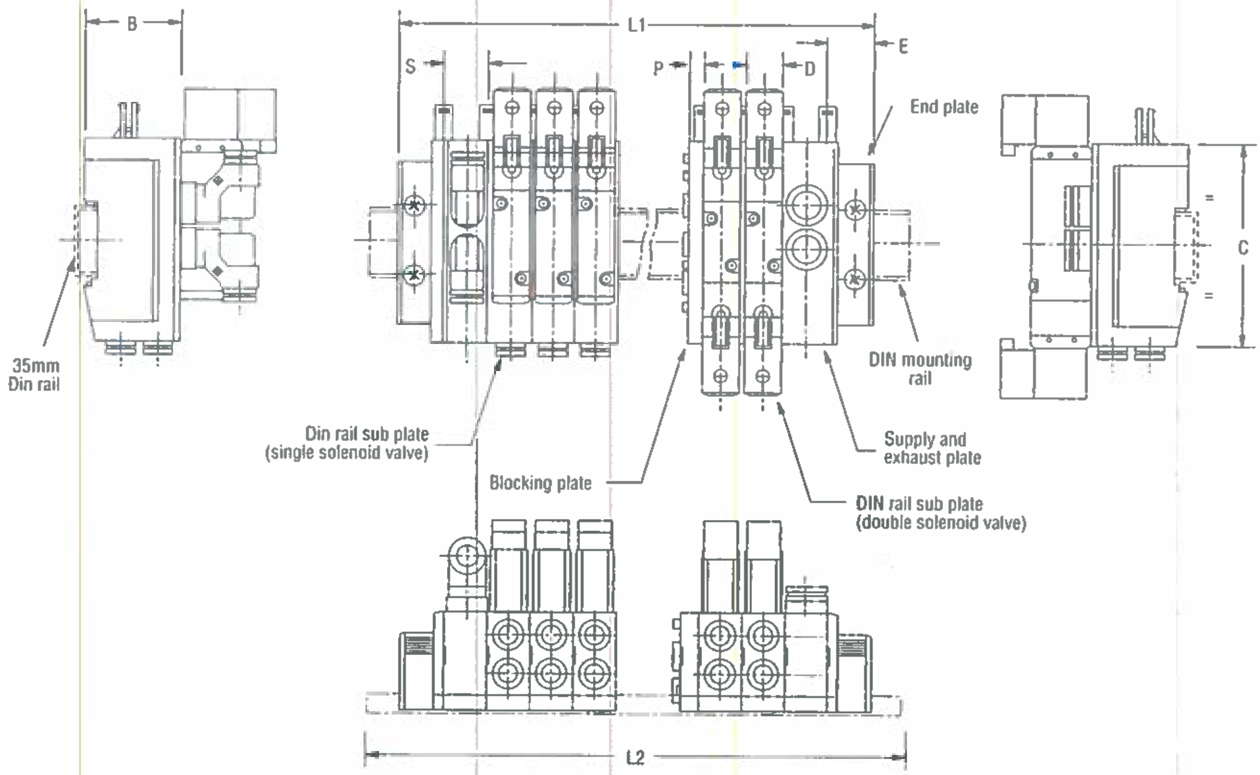
Port size	Model code
6mm	SLM-06BV
8mm	SLM-08BV
10mm	SLM-10BV
12mm	SLM-12BV

Exhaust silencers



Port size	Model code
6mm	PS06P
8mm	PS08P
10mm	PS10P
12mm	PS12P

3. Installation dimensions in mm



B	C	D	E	L1	L2	P	S
41	94	19	20	d x 19 + s x 20 + p x 8 + 40	L1 + 32	8	20

d = Number of DIN rail sub plates
s = Number of supply and exhaust plates / Intermediate supply plates / Intermediate exhaust plates
p = Number of Blocking plates

4. Ordering procedure

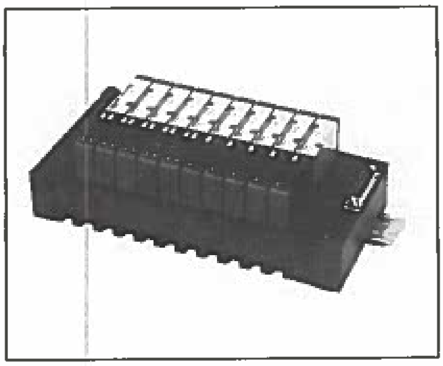
Order the number and type of valves required in accordance with the preferred model selection shown on page KBV 2.2. Order required number of DIN rail manifold components in accordance with the relevant model codes shown on pages KBD 2.1-3. These components will be supplied loose for assembly to DIN rail to suit customers application requirements.

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

Printed in Great Britain GB-P5025-0993

CKD Selex valves
Series 4TB1, 4TB2 reduced wiring manifold systems

4mm, 6mm, 8mm, 10mm load ports - 5/2 and 5/3
10, 12, 16, 20, 25, 32, 40, 50, 63, 80, 100mm



1. General description and application benefits

DIN rail mounted manifold systems with integral wiring to single connector position.
Fitted with 4TB1 or 4TB2 series 5port, 2 position and 5 port, 3 position spool valves having plug in type solenoids at one end only.

- Twin solenoids at one end.
- Plug in solenoids.
- Reduced wiring for PC's and solenoids.
- DIN rail mounted (35mm).
- Terminal connections by D type sub connector or terminal stand.
- Manual override, indicator lamps and surge protection as standard.

2. Functional symbols

4TB110, 4TB210

5 port, 2 position.
Solenoid pilot actuated.
Spring return.

4TB120, 4TB120

5 port, 2 position.
Solenoid pilot actuated at both ends.

4TB130, 4TB230

5 port, 3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Pressure held neutral.

4TB140, 4TB240

5 port, 3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Pressure release neutral.

4TB150, 4TB250

5 port, 3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Pressure applied neutral.

3. Model code

M N 4 T B * * 0 - * - * * * - * - *
[1] [2] [3] [4] [5] [6] [7] [8]

[1] Series
1 = 4TB1
2 = 4TB2

[2] Position / operator
1 = 2 position single solenoid.
2 = 2 position double solenoid.
3 = 3 position double solenoid, pressure held neutral.
4 = 3 position double solenoid, pressure release neutral.
5 = 3 position double solenoid, pressure applied neutral.
8 = Mixed manifold.

[3] Port size

4TB1 series
H4 = 4mm push in
H6 = 6mm push in
H8 = 8mm push in
HX = Mixed size push in

4TB2 series
H6 = 6mm push in
H8 = 8mm push in
H10 = 10mm push in
HX = Mixed size push in

[4] Manual override
No mark = Non locking manual override

[5] Indication/protection
L = With indicator light and surge protector
No mark = Without indicator light and surge protector

[6] Wiring method
T10 = Terminal stand
T30 = D type sub connector (vertical)
T31 = D type sub connector (sideways)

For T10 terminal stand maximum number of stations is 9
For T30 and T31 sub connectors maximum number of stations is dependant on number of valves giving a total of 20 solenoids - see under Manifold system on page 4TB 1.2

[7] Solenoid valve stations
2 = 2 stations
3 = 3 stations
etc

Maximum number of stations is dependant on wiring method used and total number of solenoids - see under Manifold system on page 4TB 1.2

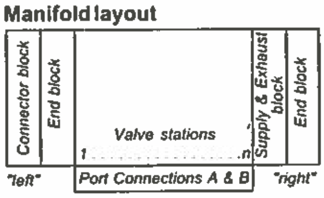
[8] Solenoid voltage
1 = 110v AC 50/60Hz
2 = 220v AC 50/60Hz
3 = 24v DC
4 = 12v DC (option)

Codes 1, 2 and 3 are standard

Ordering example:-
MN4TB120-H6-LT30-8-3 = 4TB1 series manifold of 8 stations each having a 2 position double solenoid valve of 24v DC with manual override, indicator light and surge protection. All ports 6mm push in and with vertical D type sub connector.

When ordering mixed manifolds additional information must be supplied to enable manifold to be assembled correctly.
i.e. A 4TB1 series manifold system having mixed solenoid valve types each with manual override, indicator light and surge protection operating on 110v AC 50/60Hz and with terminal stand connector block would be specified as MN4TB180-HX-LT10-6-1 with the information detailed below also supplied

Manifold layout



1) List of valve block / solenoid valves required with station numbers (Note station 1 is at left hand side as indicated on layout).
Valve blocks must be specified using the N4TB**0-H** part number shown on page 4TB 1.3.
2) Size of supply and exhaust ports required (push in fittings).

(Note:- On receipt of order the part numbers shown above will be converted into a unique SV number to ensure accurate records relating to unit supplied.)

Note: *Above covers the provision of manifolds with "standard" layouts. For systems of other arrangements such as mixed series, mixed voltages, additional supply and/or exhaust blocks etc consult CKD catalogue reference CC-N-298A and our Customer Services Department.*

4. Operating data

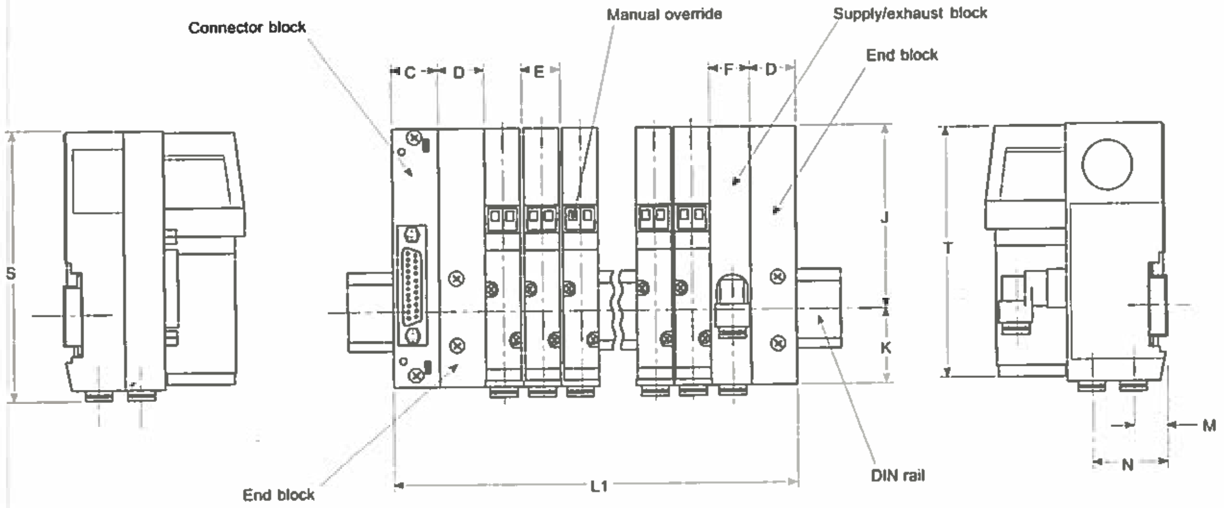
Solenoid valves

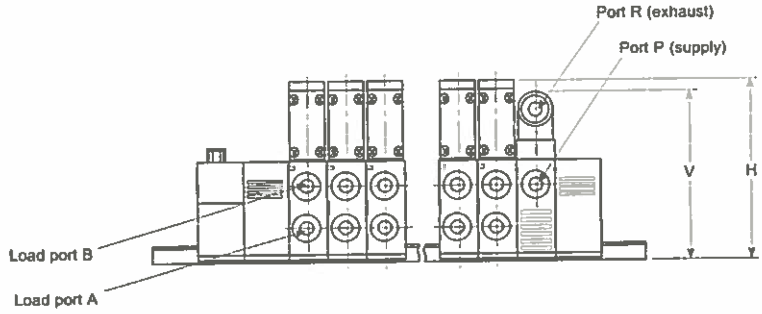
Flow factors	4TB110, 4TB120 valves - Kv = 5.14, Cv = 0.36 4TB130, 4TB140 valves - Kv = 3.14, Cv = 0.22 4TB150 valves - Kv = 2.29, Cv = 0.16 4TB210, 4TB220 valves - Kv = 11.29, Cv = 0.79 4TB230, 4TB240, 4TB250 valves - Kv = 9.29, Cv = 0.65
Maximum working pressure	7 bar (100psig)
Minimum pilot air pressure	4TB110, 4TB210 valves - 1.5 bar (21.3 psig) 4TB120, 4TB220 valves - 1.0 bar (14.2 psig) 3 position valves - 2.0 bar (28.4 psig)
Ambient operating temperature range	5°C to 50°C (41°F to 122°F)
Response times at 5bar (70psig)	2 position valves - 20msec or less 3 position valves - 30msec or less
Type of connection	Manifold plate mounted
Materials of construction	Body - Die cast aluminium alloy Spool - Aluminium Seals - Nitrile Springs - Stainless steel
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil.
Installation dimensions	See page 4TB 1.3
Mass	4TB1 series 4TB110 valves - 0.130kg 4TB120 valves - 0.135kg 3 position 4TB1 valves - 0.140kg 4TB2 series 4TB210 valves - 0.150kg 4TB220 valves - 0.155kg 3 position 4TB2 valves - 0.160kg
Solenoid coils	Class B moulded coil. Voltage tolerance +10% to -10% Nominal voltages - See position [8] of model code on page 4TB 1.1 Coil consumption at nominal voltage - 1.8/1.4W (AC), 1.9W (DC) Starting current - 56/44mA(110vAC), 28/22mA(220vAC), 80mA(24vDC) Holding current - 28/22mA(110vAC), 14/11mA(220vAC), 80mA(24vDC)
Service kits — *Spool/piston assembly*	***4TB1 series*** 4T9-101 for 4TB110 valves 4T9-102 for 4TB120 valves 4T9-103 for 4TB130 valves 4T9-104 for 4TB140 valves 4T9-105 for 4TB150 valves ***4TB2 series*** 4T9-106 for 4TB210 valves 4T9-107 for 4TB220 valves 4T9-108 for 4TB230 valves 4T9-109 for 4TB240 valves 4T9-110 for 4TB250 valves
Coil assembly	***4TB1 series*** 4TB110-[*5] - Coil - [*8] for 4TB110 valves 4TB120-[*5] - Coil - [*8] for 4TB120, 130, 140, 150 valves ***4TB2 series*** 4TB210-[*5] - Coil - [*8] for 4TB210 valves 4TB220-[*5] - Coil - [*8] for 4TB220, 230, 240, 250valves [*5] = Indication / protection (see position [5] of model code on page 4TB 1.1) [*8] = Solenoid voltage (see position [8] of model code on page 4TB 1.1)

Manifold system

Number of valve stations	With terminal stand wiring (Type T10) - 2 to 9 With D type sub connector (Types T30 or T31) - 2 to 10 for double solenoid valves - 2 to 20 for single solenoid valves - 2 to number of valves giving a total of 20 solenoids
Operating medium	Compressed air or non corrosive gas
Ambient and medium temperature	5°C to 50°C (41°F to 122°F)
Ambient humidity	35 to 85% RH (must be no dew)
Type of manifold	Common primary, common exhaust
Port size	***4TB1 series*** ***4TB2 series***
Primary (P) and Exhaust (R)	6mm, 8mm push-in 8mm, 10mm, 12mm push-in
Cylinder ports (A and B)	4mm, 6mm, 8mm push-in 6mm, 8mm 10mm push-in

5. Installation dimensions in mm





Series	A	B	C	D	E	F	H	J	K	M	N	P	R	S	T	V
4TB1	4, 6, 8	4, 6, 8	20	20	17	17	81	82.5	33.5	16.5	35	6	6	120.5	113	73
4TB1	4, 6, 8	4, 6, 8	20	20	17	17	81	82.5	33.5	16.5	35	8	8	120.5	113	75.5
4TB2	6, 8, 10	6, 8, 10	20	20	20	20	81	82.5	47	16.5	35	8	8	135	125	75.5
4TB2	6, 8, 10	6, 8, 10	20	20	20	20	81	82.5	47	16.5	35	10	10	135	125	84
4TB2	6, 8, 10	6, 8, 10	20	20	20	20	81	82.5	47	16.5	35	12	12	135	125	86

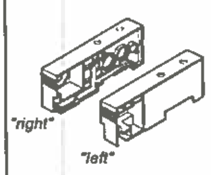
Series	L1
4TB1	(17 x e) + (17 x f) +60
4TB2	(20 x e) + (20 x f) + 60

e = Number of solenoid valve stations
f = Number of Primary / Exhaust blocks

6. Piping blocks

End block

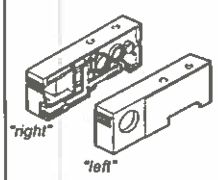
for connector block at "left"



Left end
N4TB1-1NEA1
N4TB2-2NEA1

Right end
N4TB1-1NEB2
N4TB2-2NEB2

for connector block at "right"

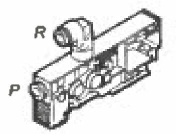


Left end
N4TB1-1NEB1
N4TB2-2NEB1

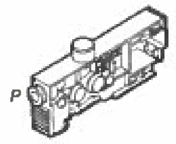
Right end
N4TB1-1NEA2
N4TB2-2NEA2

Note: In position 5 number '1' denotes TB1 series and '2;' denotes TB2 series

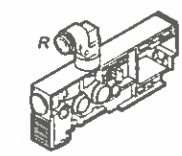
Supply and exhaust blocks



Supply/exhaust block	ØP	ØR
N4TB1-1NQSH8	8	8
N4TB1-1NQSH6	6	6
N4TB2-2NQSH12	12	12
N4TB2-2NQSH10	10	10
N4TB2-2NQSH8	8	8



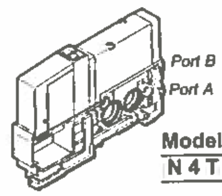
Supply block	ØP
N4TB1-1NPSH8	8
N4TB1-1NPSH6	6
N4TB2-2NPSH12	12
N4TB2-2NPSH10	10
N4TB2-2NPSH8	8



Exhaust block	ØR
N4TB1-1NRSH8	8
N4TB1-1NRSH6	6
N4TB2-2NRSH12	12
N4TB2-2NRSH10	10
N4TB2-2NRSH8	8

Note: In position 5 number '1' denotes TB1 series and '2;' denotes TB2 series

Valve block with solenoid valve



Model number

N 4 T B * * 0 - * *

[1] [2] [3]

[1] Series
1 = 4TB1
2 = 4TB2

[2] Position / operator
1 = 2 position single solenoid.
2 = 2 position double solenoid.
3 = 3 position double solenoid, pressure held neutral.
4 = 3 position double solenoid, pressure release neutral.
5 = 3 position double solenoid, pressure applied neutral.

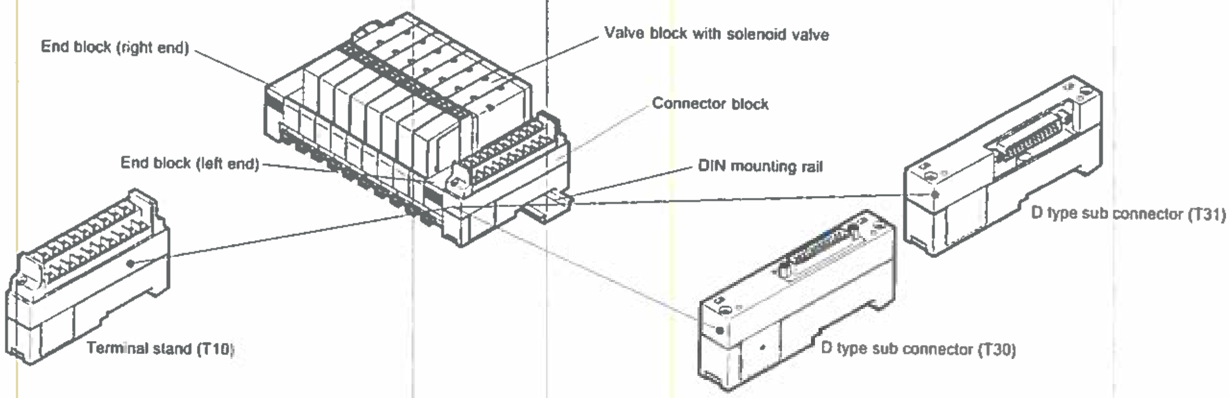
[3] Port size A and B

4TB1 series
H4 = 4mm push in
H6 = 6mm push in
H8 = 8mm push in

4TB2 series
H6 = 6mm push in
H8 = 8mm push in
H10 = 10mm push in

Note: For spares item add codes as per positions 4, 5 and 8 on page 4TB 1.1.
For valve only delete 'N' at start of code number.

7. Connector blocks and connections

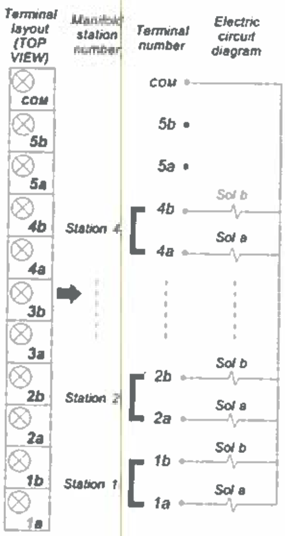


Wiring method T10 (for up to 9 stations)

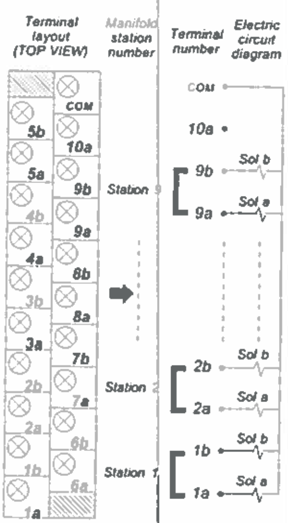
The terminal numbers (marked on the terminal stand cover) correspond to the manifold solenoids as shown in the charts below. The manifold stations are numbered from left to right with piping port to front irrespective of wiring block position.

Manifold internal connections

For manifolds of 4 stations or less

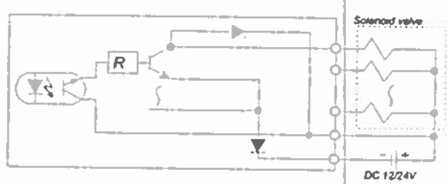


For manifolds of 5 - 9 stations

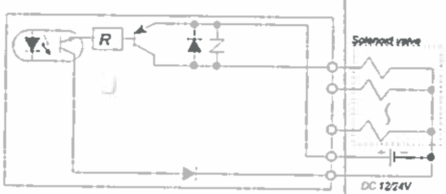


Exclusive power source is not provided to the manifold. This must be supplied separately. For independent contact type PC output unit common wiring is not provided to the contact part. This must be provided separately.

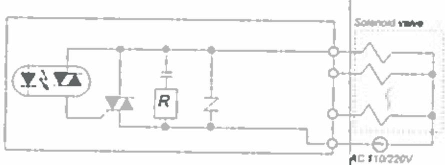
DC output unit (NPN output)



DC output unit (PNP output)



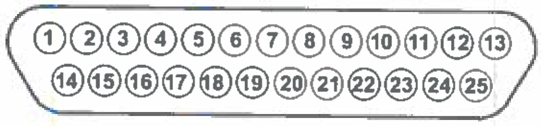
AC output unit



Wiring methods T30 and T31 (for up to 20 stations)

The connector pin numbers correspond to the manifold solenoids as shown in the charts below. The manifold stations are numbered from left to right with piping port to front irrespective of wiring block position.

Connector pin wiring examples



Connections for single solenoid valves (20 manifold stations or less).

Pin No	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No	1a	3a	5a	7a	9a	11a	13a	15a	17a	19a			COM
Pin No	14	15	16	17	18	19	20	21	22	23	24	25	
Valve No	2a	4a	6a	8a	10a	12a	14a	16a	18a	20a			

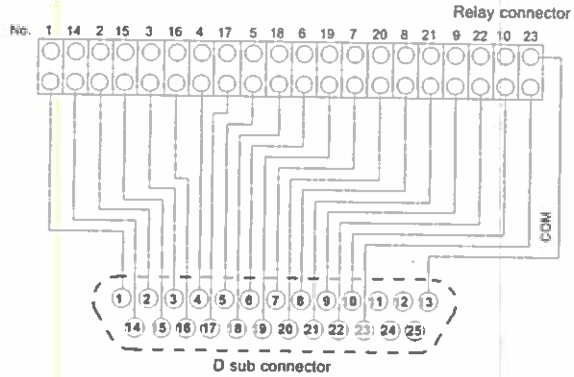
Connections for double solenoid valves (10 manifold stations or less).

Pin No	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a			COM
Pin No	14	15	16	17	18	19	20	21	22	23	24	25	
Valve No	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b			

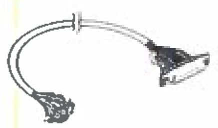
The Valve No numerals correspond to station number and letters 'a' and 'b' correspond to solenoid.

Connections for mixed solenoid valves (20 solenoids or less).
Connections will be dependant on manifold layout.

Internal circuit



Connecting cable with 'D' sub connector



3 metre length
T30 - FL3
5 metre length
T30 - FL5

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel:- +44 (0) 1952 586000 Fax:- +44 (0) 1952 586798

Printed in Great Britain GB-P5042-0996

VICKERS

Pneumatics

Spool valves
Series VS23

1/4" BSP - 5/2 and 5/3
50, 63, 80, 100mm

Description
5 port 2 position and 3 position spool valve, Air, solenoid, lever or roller operated.

Type of Connection
B.S.P. Screw Thread.

Port Sizes
¼ B.S.P. Main ⅛ B.S.P. Pilot.

Operating Pressures
Double Sol./Sol. Air 1-10 bar.
Sol. Spring 2.5-10 bar.
Double Air 0-10 bar.

Minimum Pilot Air pressure
(At 6.3 bar, body pressure)
Air operated 1.0 bar.
Spring return types 2.5 bar.

Flow to Atmosphere
(At 6.3 bar, body pressure)
2 Position Valves 45 dm^3/s.
3 Position Valves 34 dm^3/s.

Operating Temperature (Ambient)
-10°C to + 75°C Air operation
-10°C to + 50°C Solenoid Operation

Type of Lubricant
Shell-Tellus 37 but not essential

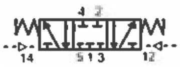
Materials of Construction
Zinc die cast body and shells, stainless steel spool and springs. Plastic moulded end covers and spool bearings and nitrile rubber seals.

KV Flow Factor
2 Position Valves-25.
3 Position Valves-20

VS 23/15
Air operated,
Spring return.

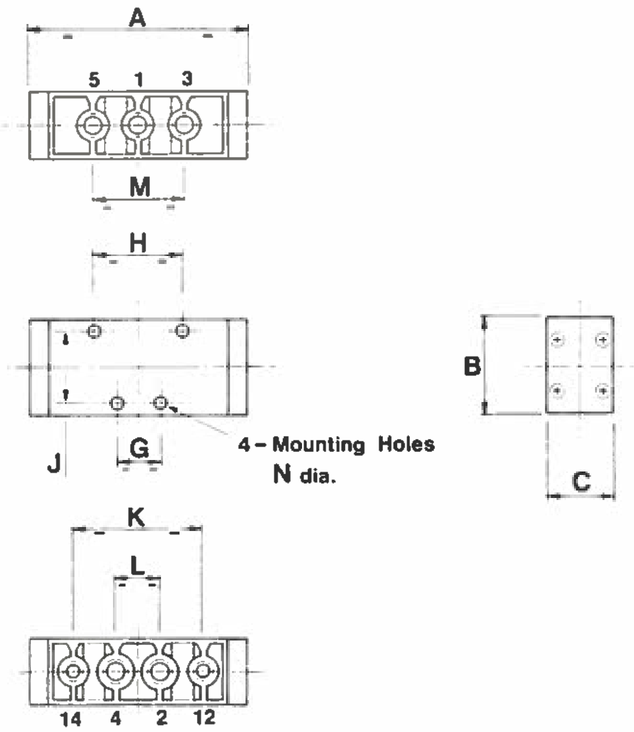
VS 23/16
Double air operated.

VS 23/16P
Double air operated,
Pressure held neutral.

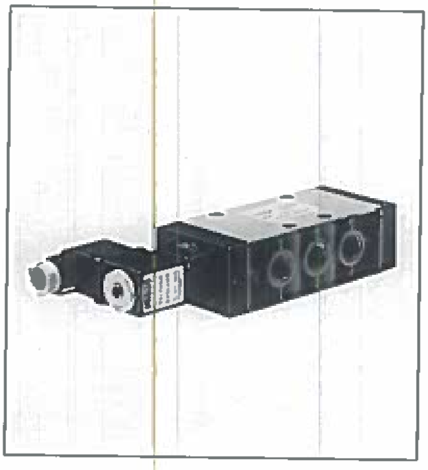


VS 23/16U
Double air operated,
Pressure release neutral.

Principal Dimensions



A	B	C	G	H	J	K	L	M	N
117	52	35	24	48	38	68	24	48	6.5

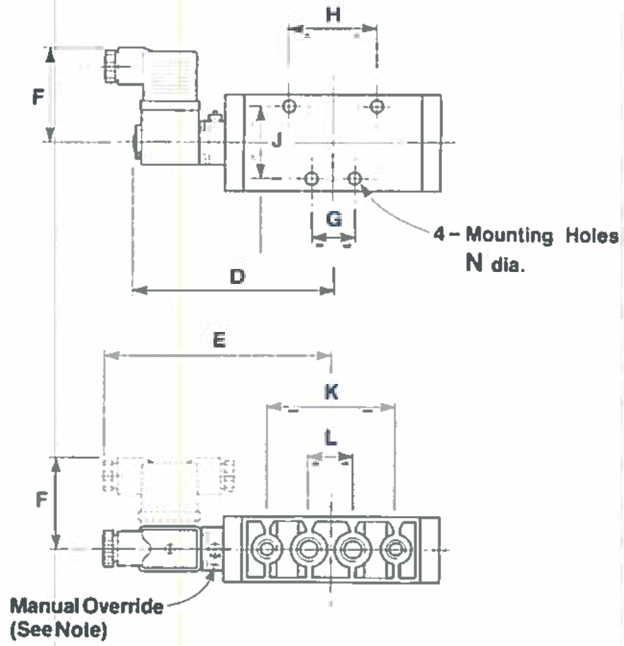


VS 23/51
Single solenoid
with manual override,
Spring return

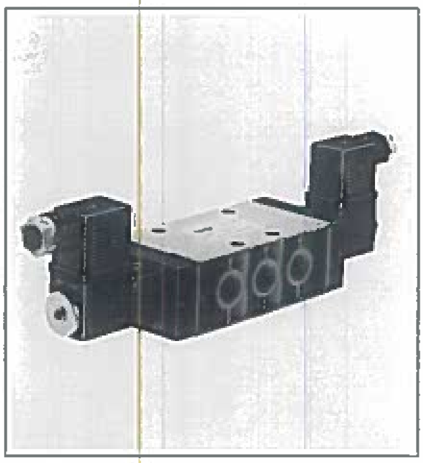
VS 23/52
Single solenoid
with manual override,
Air return

Note: Manual Override operator is lever and/or screwdriver actuated and can be removed to delete this facility if not required

Principal Dimensions

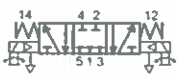


D	E	F	G	H	J	K	L	N
106	122	50	24	48	38	68	24	6.5.



VS 23/53
Double solenoid with
manual override

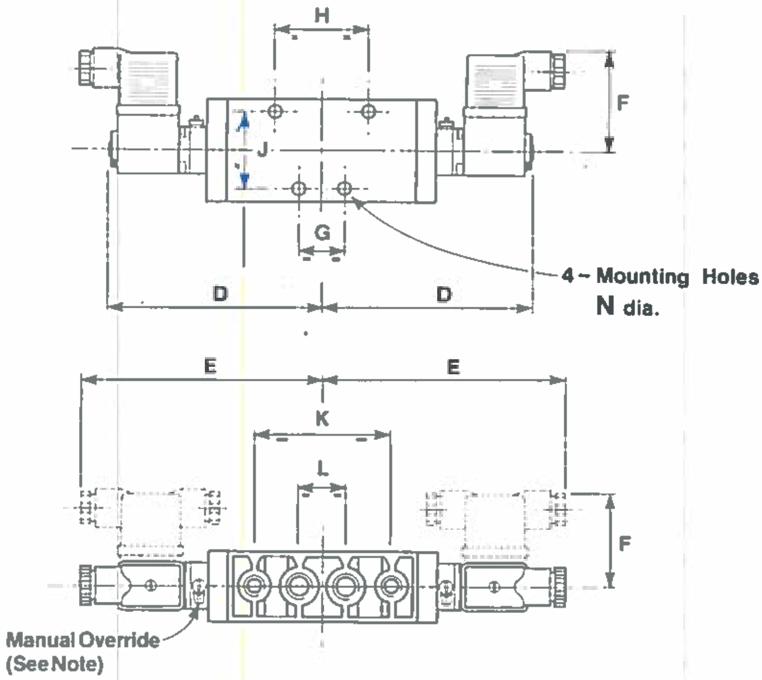
VS 23/50P
Double solenoid with
manual override,
Pressure held neutral.



VS 23/50U
Double solenoid,
manual override,
Pressure release neutral.

Note: Manual Override operator is lever and/or screwdriver actuated and can be removed to delete this facility if not required

Principal Dimensions

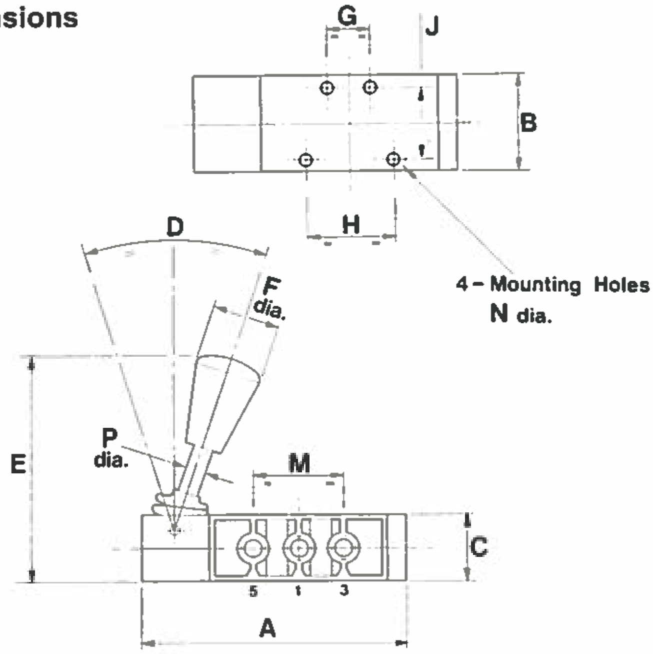


D	E	F	G	H	J	K	L	N
106	122	50	24	48	38	68	24	6.5.

VS 23/3
Lever operated
spring return.

VS 23/3L
Lever operated
2 position positive.

Principal Dimensions



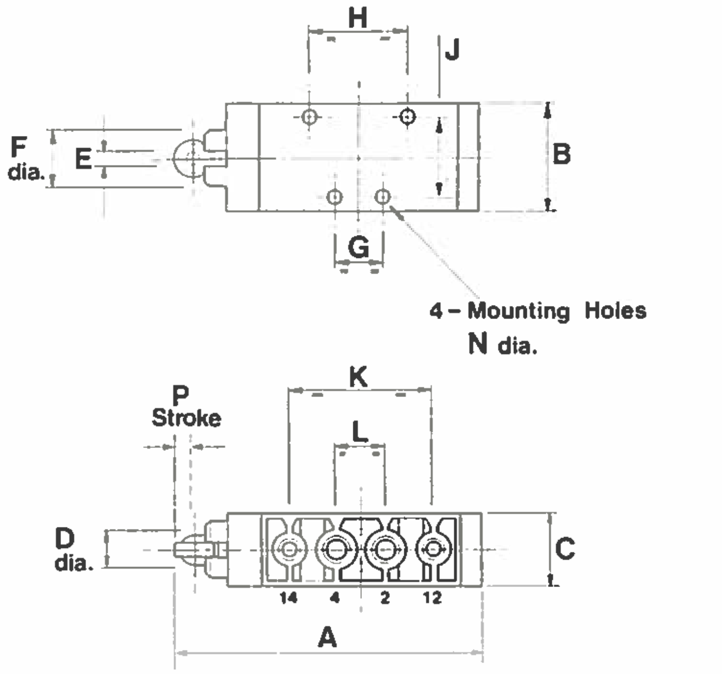
A	B	C	D	E	F	G	H	J	M	N	P
137	52	35	38°	120	35	24	48	38	48	6.5	10

Operating Force Required 50N (at 1-10 bar pressure)

VS 23/5
Roller operated,
spring return

VS 23/5A
Roller operated,
air return.

Principal Dimensions



A	B	C	D	E	F	G	H	J	K	L	P
145	52	35	19	6.3	24	24	48	38	68	24	7.5

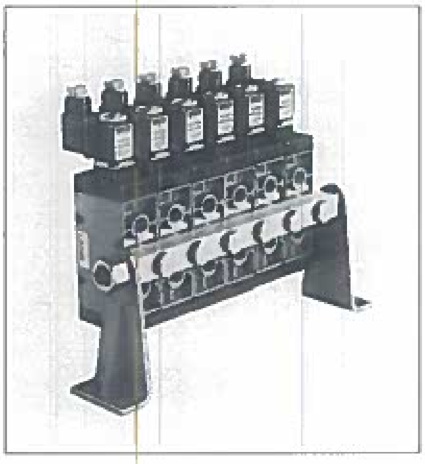
Operating Force Required 120N (at 1-10 bar pressure)

VICKERS

Pneumatics

Spool valves Series VS23

Feeder bar assemblies 3/8" BSP



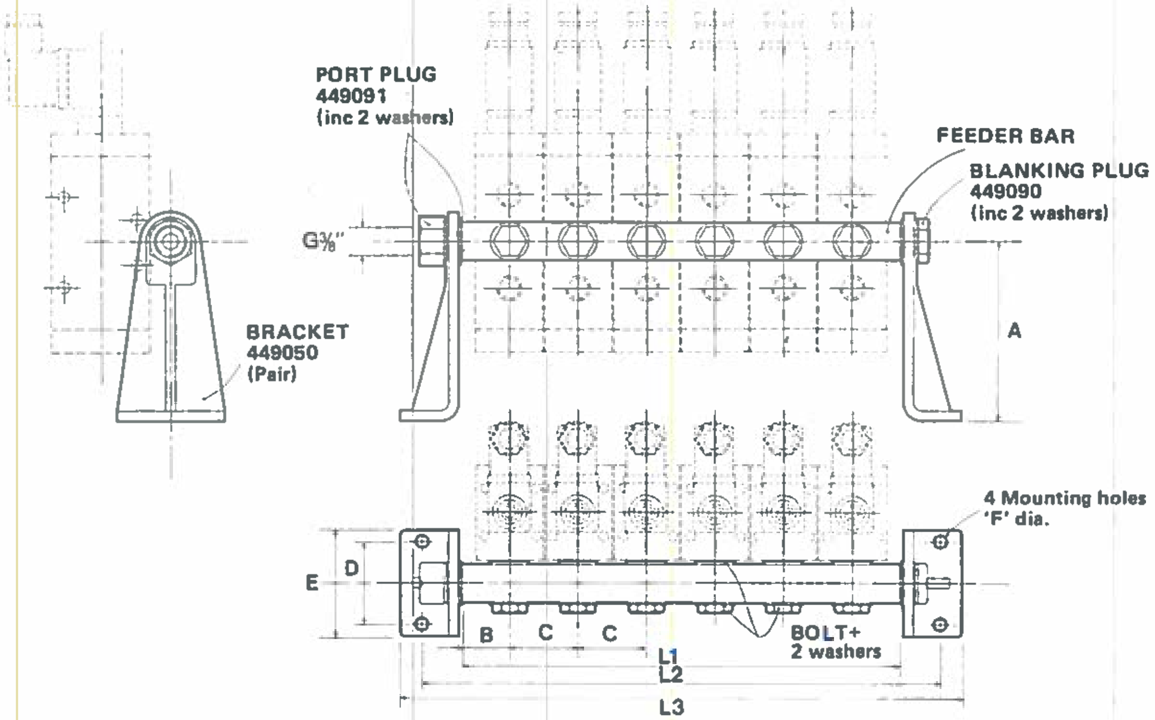
Description
Feeder bar assemblies for use with VS23 Series valves (see p VS23.1-2).
Available for arrangements from 2 to 6 valves.

Type of Connection
Screwthread.

Port Sizes
Inlet G3/8".

Note
Feeder bars can be supplied as bar plus required number of bolts and washers only or complete with mounting brackets, blanking plug and port plug. Requirements to be specified at time or ordering.

Principal Dimensions



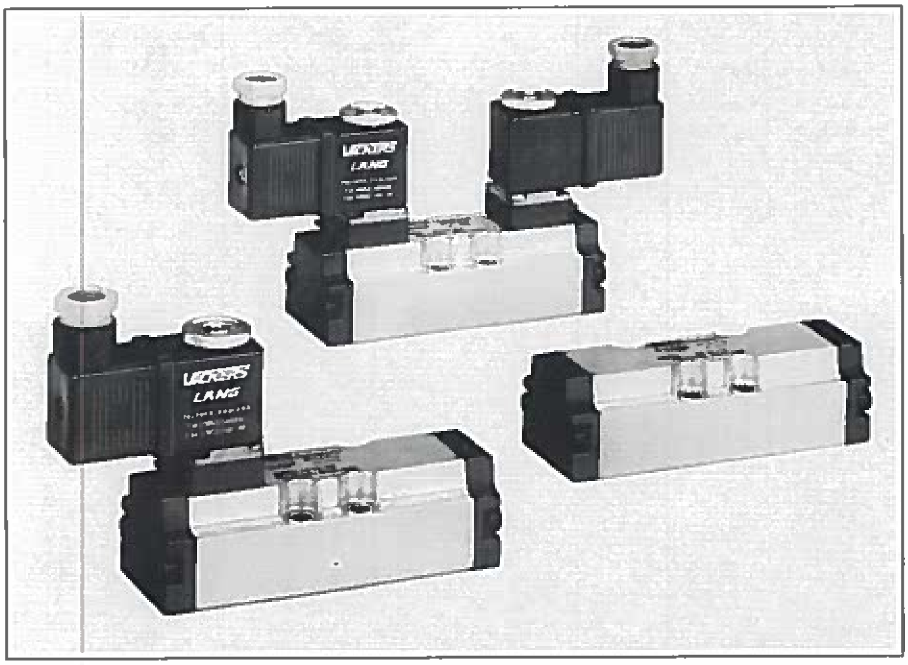
Number of Valves	Feeder Bar Number	Bolt (inc. 2 washers) Number	(Qty.)	A	B	C	D	E	F	L1	L2	L3
2	449052	449049	(2)	95	25	36	44	56	7	86	128	148
3	449053	449049	(3)	95	25	36	44	56	7	122	164	184
4	449054	449049	(4)	95	25	36	44	56	7	158	200	220
5	449055	449049	(5)	95	25	36	44	56	7	194	236	256
6	449056	449049	(6)	95	25	36	44	56	7	230	272	292

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

Spool Valves
Series VS16

ISO 1 Interface – 5/2 and 5/3

32, 40, 50, 63mm



1. General description and application benefits

A compact 5 port, 2 or 3 position spool valve with ISO 5599-1 size 1 interface for manifold mounting. Solenoid or air operated either to control double acting cylinders or as a pilot for larger valves. Efficient, reliable and responsive for use in a wide variety of applications.

- Fully balanced spool design
- Fast response
- Lube for life
- Low pilot pressures
- Low power consumption solenoids
- Sub-base mounted to ISO1 standard
- Manifold mounting facility

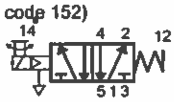
2. Functional symbols

ISO symbols and codes shown are in accordance with ISO 5599-3

VS 16/15
(ISO code 104)

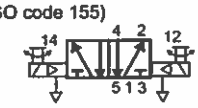
5 port
2 position.
Air actuated.
Spring return.

VS 16/51**
(ISO code 152)



5 port
2 position.
Solenoid pilot
actuated.
Spring return.

VS 16/53**
(ISO code 155)



5 port
2 position.
Solenoid pilot
actuated at both
ends.

VS 16/16
(ISO code 101)

5 port
2 position.
Air actuated at
both ends.

VS 16/52**
(ISO code 154)

5 port
2 position.
Solenoid pilot
actuated.
External supply air
return.

Graphical symbols ref ISO 1219 (BS 2917)

3. Model code

VS	16	/	**	**
			1	2

[1] Version code

15 = 2 position, air actuated, spring return.
16 = 2 position, air actuated at both ends.
51 = 2 position, solenoid pilot actuated, spring return.
52 = 2 position, solenoid pilot actuated, air return.
53 = 2 position, solenoid pilot actuated at both ends.

Note: *All solenoid operated valves are fitted with manual override facility which is lever and/or screwdriver actuated and can be removed to delete this facility if not required.*

[2] Voltage code

JZ = 12v DC
KZ = 24v DC
MZ = 48v DC
KY = 24v 50/60Hz AC
MY = 48v 50/60Hz AC
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC

Preferred model selection

The products listed represent the standard product range most readily available.

Note: *Valves are supplied as sub-decks complete with 4 off mounting screws and interface gasket for mounting on manifolds ISO 5599-1 interface size 1.*

Model	Description
VS16/15	5 port, 2 position, air actuated, spring return.
VS16/16	5 port, 2 position, air actuated at both ends.
VS16/51**	5 port, 2 position,solenoid pilot actuated, spring return.
VS16/52**	5 port, 2 position, solenoid pilot actuated, external supply air return.
VS16/53**	5 port, 2 position, solenoid pilot actuated at both ends.

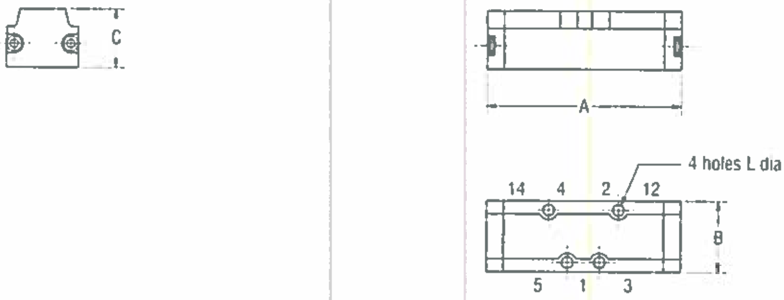
** = Solenoid voltage code – to be specified (see position [2] above)

4. Operating data

Flow factors	Conductance C = 2.04 dm^3/sec/bar Critical pressure ratio b = 0.38 Kv = 10.0 Cv = 0.70
Flow to atmosphere at 6.3 bar (90 psig) body pressure	19 dm^3/sec (40.25 scfm)
Minimum pilot air pressure at 6.3 bar (90 psig) body pressure	Air operated – 1.0 bar (14.5 psig) Spring return – 2.0 bar (29 psig)
Maximum operating pressure	10 bar (145 psig)
Ambient operating temperature (ambient)	Air operated -10°C to +75°C (15°F to 167°F) Solenoid operated -10°C to +50°C (15°F to 123°F)
Response times at 6.3 bar (90 psig)	Monostable – ON 20 milliseconds OFF 50 milliseconds Bistable – ON 15 milliseconds OFF 15 milliseconds
Cycling rate at 6.3 bar (90 psig)	800 cycles per minute at 20°C (68°F) ambient – Monostable
Type of connection	Manifold to ISO 5599-1 interface size 1
Materials of construction	Body – Zinc die cast epoxy painted End covers – Zinc die cast epoxy painted Spool – Stainless steel Springs – Stainless steel Seals – Nitrile Shells – Plastic moulded
Type of lubricant	Lube for life therefore not essential but if installed in lubricated system use ISO VG37 mineral oil
Installation dimensions	See page VS 16.4
Mass	VS16/15 0.492 kg (1.08 lb) VS16/16 0.500 kg (1.10 lb) VS16/51** 0.560 kg (1.23 lb) VS16/52** 0.550 kg (1.21 lb) VS16/53** 0.625 kg (1.38 lb)
Manifolds	For details see pages VS 16.5-6
Solenoid coils	Fully encapsulated and tropicalised Class F insulation 155°C (310°F) Protection class I.P.65 when fitted with 3 pin socket connection to DIN43650 Type B Ambient temperature -10°C to +50°C (15°F to 123°F) Nominal voltages – See position [2] of model code (page VS 16.2) Voltage tolerance – +15% to -10% Coil consumption at nominal voltage and 20°C (68°F) ambient DC coils – 5W maximum AC coils – 5VA holding – 8VA nominal inrush Lower power coils available on request
Service kits	Valve – VS16/15, VS16/16 – Fit new unit – VS16/51 – VS16/38B – VS16/52 – VS16/39C – VS16/53 – VS16/37A Solenoid coil – VEM13-141** Solenoid stem assembly – VEM13-226

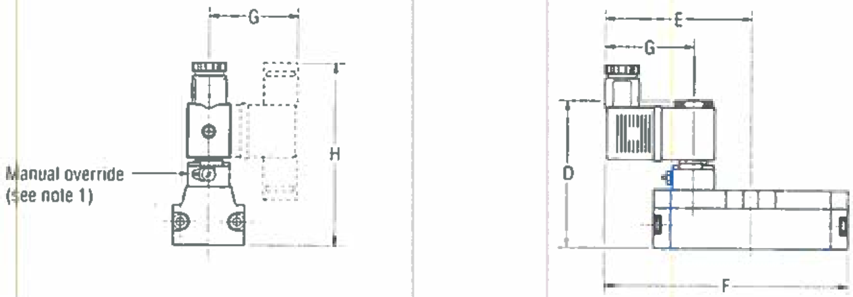
5. Installation dimensions in mm (inches)

VS16/15, VS16/16

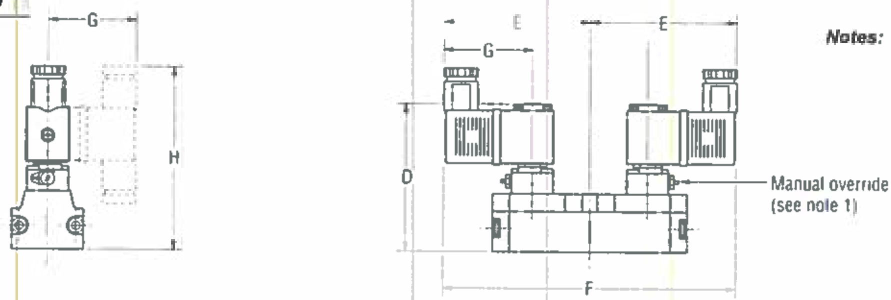


Model code	A	B	C	L dia
VS16/15	105 (4.13)	38 (1.50)	32 (1.26)	5.2 (0.20)
VS16/16	105 (4.13)	38 (1.50)	32 (1.26)	5.2 (0.20)

VS16/51, VS16/52****



VS16/53**



Notes:

1) *Manual override operator is lever and/or screwdriver actuated and can be removed to delete this facility if not required.*

2) *All drawings on this page are reproduced to a scale of 0.25 (Copy 4 times at 141% to give full size).*

Model code	D	E	F	G	H
VS16/51**	80 (3.15)	78 (3.07)	133 (5.24)	50 (1.97)	96 (3.78)
VS16/52**	80 (3.15)	78 (3.07)	133 (5.24)	50 (1.97)	96 (3.78)
VS16/53**	80 (3.15)	78 (3.07)	156 (6.14)	50 (1.97)	96 (3.78)

6. Ordering procedure

Order as preferred model selection and valve will be supplied as sub-deck complete with 4 off mounting screws and interface gasket.

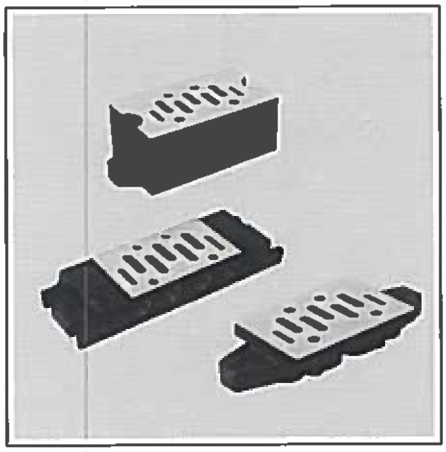
** When ordering solenoid operated versions ensure solenoid voltage code is added to model code.

For order codes and details of manifolds to ISO 5599-1 interface size 1 for use with these valves see pages VS 16.5-6.

Pneumatics

Spool valves
Series VS16

Single manifolds
ISO 1 interface



1. General description

A range of side ported and base ported manifolds for VS16 series valves.

Base ported version available with 1/4" BSP inlet, outlet and exhaust ports and 1/8" BSP pilot ports.

Side ported versions available with 1/8" BSP inlet, outlet, exhaust and pilot ports or 1/4" BSP inlet and outlet ports, 3/8" BSP exhaust ports and 1/8" BSP pilot ports.

2. Model code

		Inlet	Outlet	Exhaust	Pilot
448687	ISO 1 Base ported BSP	G1/4"	G1/4"	G1/4"	G1/8"
482834	ISO 1 Side ported BSP	G1/4"	G1/4"	G3/8"	G1/8"
806176	ISO 1 Side ported BSP	G1/8"	G1/8"	G1/8"	G1/8"

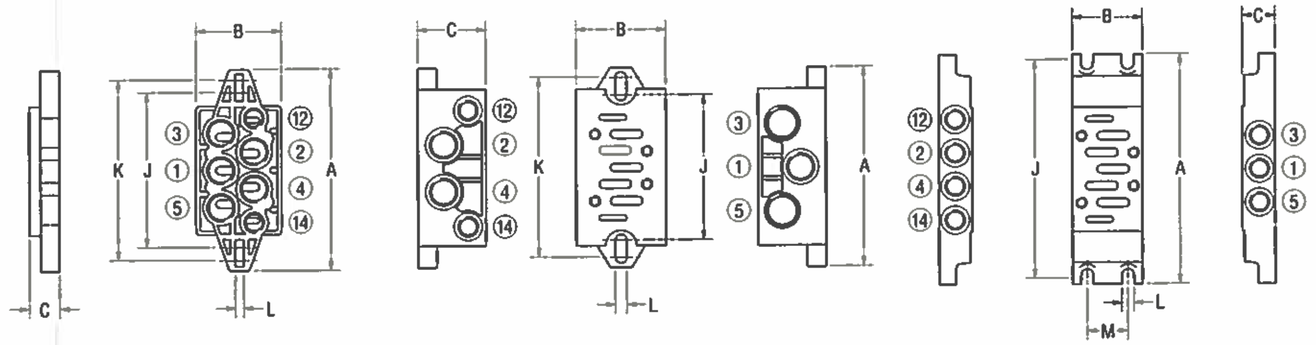
3. Operating data

All operating data for manifold units is consistent with that for the relevant valves mounted onto the manifold.

Mass	448687	0.185kg (0.41lb)
	482834	0.530kg (1.17lb)
	806176	0.240kg (0.53lb)

4. Installation dimensions in mm (inches)

448687 482834 806176



Model code	A	B	C	J	K	L	M
448687	110 (4.33)	45 (1.77)	16 (0.63)	80 (3.15)	98 (3.86)	5.5 (0.22)	
482834	110 (4.33)	48 (1.89)	36 (1.42)	80 (3.15)	98 (3.86)	5.5 (0.22)	
806176	124 (4.88)	38 (1.50)	18 (0.71)	115 (4.53)		3.0 (0.12)	25 (0.98)

***Note:** All drawings on this page are reproduced to a scale of 0.25 (Copy 4 times at 141% to give full size).*

5. Ordering procedure

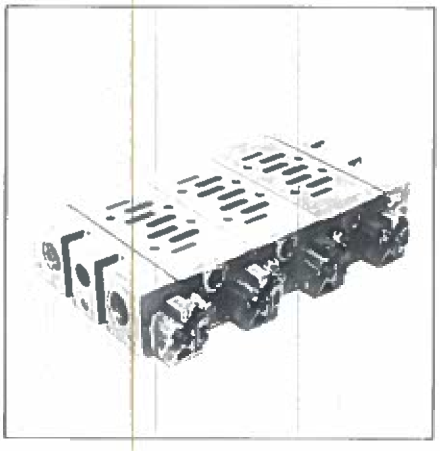
Order in accordance with model codes shown above to suit installation requirements for valves.

VICKERS

Pneumatics

Spool valves Series VS16

Gang manifolds ISO 1 Interface



1. General description

Side and base ported gang manifold bases for VS16 series valves to provide 2 to 8 station assemblies.

End plates are supplied in pairs with left hand plate end ported 3/8" BSP for exhaust connections and right hand plate end ported 3/8" BSP for inlet connection.

Manifold station units are base ported 1/4" BSP for outlet connections and base and side ported 1/8" BSP for pilot connections.

2. Model code

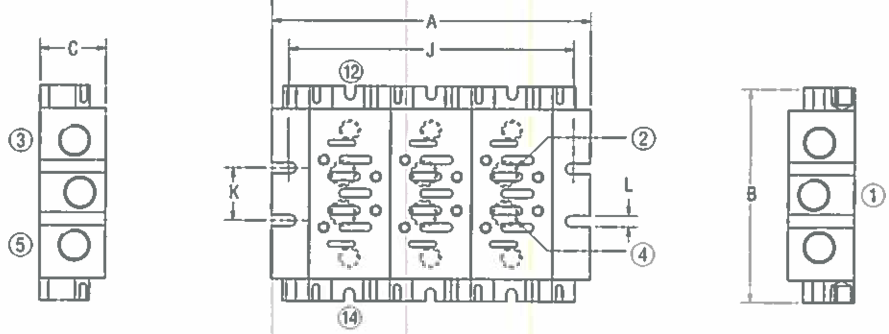
		Inlet Port 1	Outlet Ports 2&4	Exhaust Ports 3&5	Pilot Ports 12&14
482835	ISO 1 Manifold station BSP		G1/4"		G1/8"
482836	End plates (pair) BSP	G3/8"(RH)		G3/8"(LH)	

3. Operating data

All operating data for manifold units is consistent with that for the relevant valves mounted onto the manifold.

Mass	482835	0.250kg (0.55lb)
	482836	0.250kg (0.55lb)

4. Installation dimensions in mm (inches)



A	B	C	J	K	L
N x 43 (1.69) + 40 (1.57)	116 (4.57)	35 (1.38)	N x 43 (1.69) + 20 (0.79)	28 (1.10)	7 (0.27)

Note: All drawings on this page are reproduced to a scale of 0 25 (Copy 4 times at 141% to give full size).

N = Number of stations

5. Ordering procedure

Order in accordance with model codes shown above to suit installation requirements for valves.

i.e. For 6 station assembly
Order 6 off 482835
and 1 off 482836

The manifold stations are supplied with integral gaskets and necessary inter connecting screws and blanking plugs.

Pneumatics

Spool valves
Series VS26

ISO 2 Interface – 5/2 and 5/3

50, 63, 80, 100mm

1. General description and application benefits

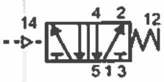
A compact 5 port, 2 or 3 position spool valve with ISO 5599-1 size 2 interface for manifold mounting. Solenoid or air operated either to control double acting cylinders or as a pilot for larger valves. Efficient, reliable and responsive for use in a wide variety of applications.

- Fully balanced spool design
- High flow
- Fast response
- Lube for life
- Low pilot pressures
- Low power consumption solenoids
- Sub-base mounted to ISO2 standard
- Manifold mounting facility

2. Functional symbols

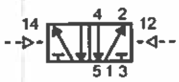
ISO symbols and codes shown are in accordance with ISO 5599-3

VS26/15
(ISO code 104)



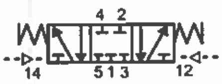
5 port
2 position.
Air actuated.
Spring return.

VS26/16
(ISO code 101)



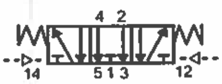
5 port
2 position.
Air actuated at both ends.

VS26/16P
(ISO code 106)



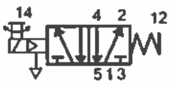
5 port
3 position.
Spring centred.
Air actuated at both ends.
All ports closed.

VS26/16U
(ISO code 108)



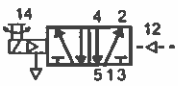
5 port
3 position.
Spring centred
Air actuated at both ends.
Load ports open to exhaust ports.

VS26/51**
(ISO code 152)



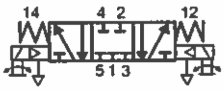
5 port
2 position.
Solenoid pilot actuated.
Spring return.

VS26/52**
(ISO code 154)



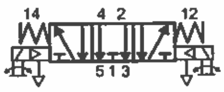
5 port
2 position.
Solenoid pilot actuated.
External supply air return.

VS26/50P**
(ISO code 156)



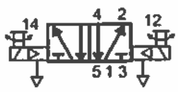
5 port
3 position.
Spring centred.
Solenoid pilot actuated at both ends.
All ports closed.

VS26/50U**
(ISO code 157)



5 port
3 position.
Spring centred.
Solenoid pilot actuated at both ends.
Load ports open to exhaust ports.

VS26/53**
(ISO code 155)



5 port
2 position.
Solenoid pilot actuated at both ends.

Graphical symbols ref ISO 1219 (BS 2917)

3. Model code

V S	2 6	/	* *	*	* *
			1	2	3

[1] Version code

15 = 2 position, air actuated, spring return.
16 = 2 position, air actuated at both ends.
50 = 3 position, solenoid pilot actuated at both ends.
51 = 2 position, solenoid pilot actuated, spring return.
52 = 2 position, solenoid pilot actuated, air return.
53 = 2 position, solenoid pilot actuated at both ends.

Note: *All solenoid operated valves are fitted with manual override facility which is lever and/or screwdriver actuated and can be removed to delete this facility if not required.*

[2] 3 position valve model code

P = Spring centred, all ports closed.
U = Spring centred, load ports open to exhaust ports.

Note: *For two position valves this position is not used.*

[3] Voltage code

JZ = 12v DC
KZ = 24v DC
MZ = 48v DC
KY = 24v 50/60Hz AC
MY = 48v 50/60Hz AC
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC

Preferred model selection

The products listed represent the standard product range most readily available.

Note: *Valves are supplied as sub-decks complete with 4 off mounting screws and interface gasket for mounting on manifolds ISO 5599-1 interface size 2.*

Model	Description
VS26/15	5 port, 2 position, air actuated, spring return.
VS26/16	5 port, 2 position, air actuated at both ends.
VS26/16P	5 port, 3 position, spring centred, air actuated at both ends, all ports closed.
VS26/16U	5 port, 3 position, spring centred, air actuated at both ends, load ports open to exhaust ports.
VS26/50P**	5 port, 3 position, spring centred, solenoid pilot actuated at both ends, all ports closed.
VS26/50U**	5 port, 3 position, spring centred, solenoid pilot actuated at both ends, load ports open to exhaust ports.
VS26/51**	5 port, 2 position, solenoid pilot actuated, spring return.
VS26/52**	5 port, 2 position, solenoid pilot actuated, external supply air return.
VS26/53**	5 port, 2 position, solenoid pilot actuated at both ends.

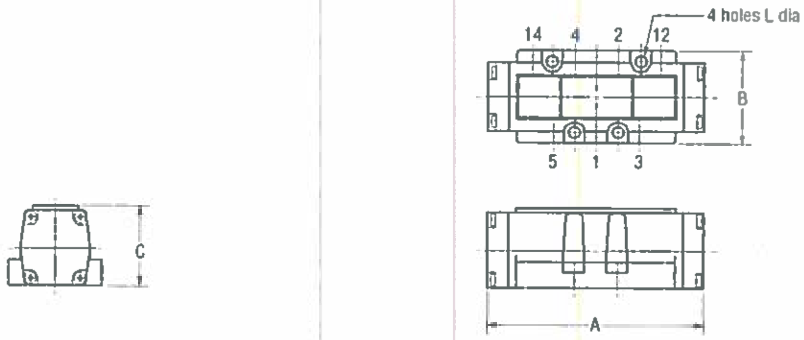
** = Solenoid voltage code – to be specified (see position [3] above)

4. Operating data

Flow factors	2 position valves	Conductance C = 6.00 dm³/s/bar Critical pressure ratio b = 0.50 Kv = 25.0 Cv = 1.72
Flow factors	3 position valves	Conductance C = 4.80 dm³/s/bar Critical pressure ratio b = 0.40 Kv = 20.0 Cv = 1.40
Flow to atmosphere at 6.3 bar (90 psig) body pressure	2 position valves – 50 dm³/sec (106 scfm) 3 position valves – 38 dm³/sec (80.5 scfm)	
Minimum pilot air pressure at 6.3 bar (90 psig) body pressure	Air operated – 1.0 bar (14.5 psig) Spring return – 2.5 bar (36.25 psig)	
Maximum operating pressure	10 bar (145 psig)	
Maximum operating temperature (ambient)	Air operated -10°C to +75°C (15°F to 167°F) Solenoid operated -10°C to +50°C (15°F to 123°F)	
Response times at 6.3 bar (90 psig)	Monostable – ON – 40 milliseconds OFF 70 milliseconds Bistable – ON – 45 milliseconds OFF 45 milliseconds	
Cycling rate at 6.3 bar (90 psig)	500 cycles per minute at 20°C (68°F) ambient – Monostable	
Type of connection	Manifold to ISO 5599-1 interface size 2	
Materials of construction	Body – Zinc die cast epoxy painted End covers – GRP Spool – Stainless steel Springs – Stainless steel Seals – Nitrile Shells – Zinc die cast	
Type of lubricant	Lube for life therefore not essential but if installed in lubricated system use ISO VG37 mineral oil	
Installation dimensions	See pages VS 26.4	
Mass	VS26/15 VS26/16 VS26/16P VS26/16U VS26/50P** VS26/50U** VS26/51** VS26/52** VS26/53**	0.650 kg (1.43 lb) 0.700 kg (1.54 lb) 0.800 kg (1.76 lb) 0.800 kg (1.76 lb) 0.950 kg (2.09 lb) 0.950 kg (2.09 lb) 0.800 kg (1.76 lb) 0.800 kg (1.76 lb) 0.850 kg (1.87 lb)
Manifolds	For details see pages VS 26.5-6	
Solenoid coils	Fully encapsulated and tropicalised Class F insulation 155°C (310°F) Protection class I.P.65 when fitted with 3 pin socket connection to DIN43650 Type B Ambient temperature -10°C to +50°C (15°F to 123°F) Nominal voltages – See position 3 of model code (page VS 26.2) Voltage tolerance – +15% to -10% Coil consumption at nominal voltage and 20°C (68°F) ambient DC coils – 5W maximum AC coils – 5VA holding – 8VA nominal inrush Lower power coils available on request	
Service kits	Valve – VS26/15, VS26/16, VS26/16P, VS26/16U – Fit new unit VS26/50P – VS26/36PD VS26/50U – VS26/36UE VS26/51 – VS26/38B VS26/52 – VS26/39C VS26/53 – VS26/37A Solenoid coil – VEM13-141** Solenoid stem assembly – VEM13-226	

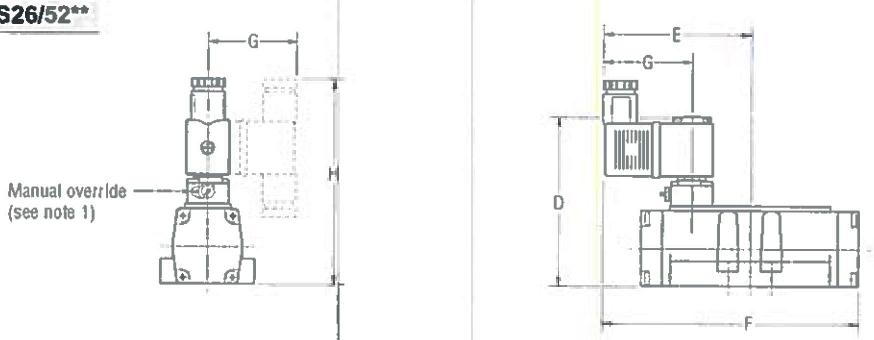
5. Installation dimensions in mm (inches)

VS26/15, VS26/16, VS26/16P, VS26/16U

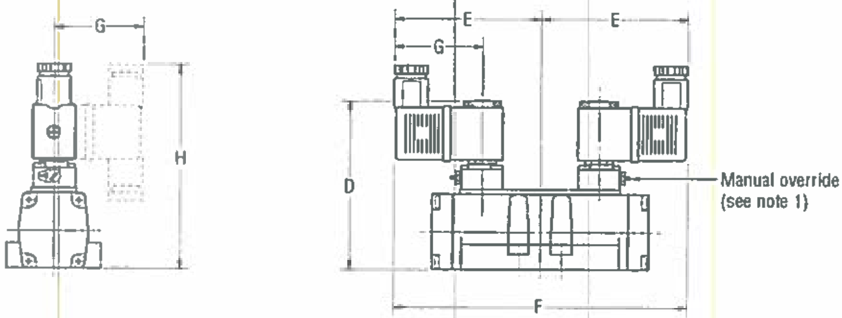


Model code	A	B	C	L(dia)
VS26/15	118 (4.65)	50 (1.97)	43 (1.69)	6.1 (0.24)
VS26/16	118 (4.65)	50 (1.97)	43 (1.69)	6.1 (0.24)
VS26/16P	118 (4.65)	50 (1.97)	43 (1.69)	6.1 (0.24)
VS26/16U	118 (4.65)	50 (1.97)	43 (1.69)	6.1 (0.24)

VS26/51**, VS26/52**



VS26/50P**, VS26/50U**, VS26/53**



Notes: 1) *Manual override operator is lever and/or screwdriver actuated and can be removed to delete this facility if not required.*

2) *All drawings on this page are reproduced to a scale of 0.25 (Copy 4 times at 141% to give full size).*

Model code	D	E	F	G	H
VS26/50P**	90 (3.54)	78 (3.07)	156 (6.14)	50 (1.97)	106 (4.17)
VS26/50U**	90 (3.54)	78 (3.07)	156 (6.14)	50 (1.97)	106 (4.17)
VS26/51**	90 (3.54)	78 (3.07)	137 (5.39)	50 (1.97)	106 (4.17)
VS26/52**	90 (3.54)	78 (3.07)	137 (5.39)	50 (1.97)	106 (4.17)
VS26/53**	90 (3.54)	78 (3.07)	156 (6.14)	50 (1.97)	106 (4.17)

6. Ordering procedure

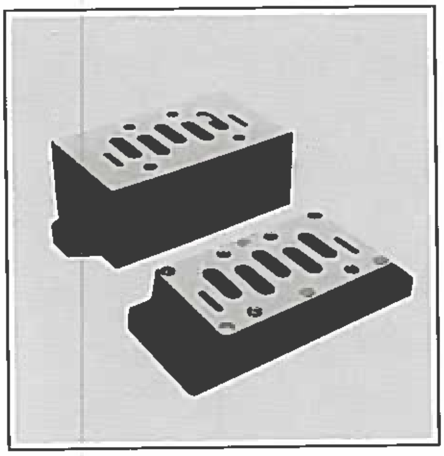
Order as preferred model selection and valve will be supplied as sub-deck complete with 4 off mounting screws and interface gasket.

** When ordering solenoid operated versions ensure solenoid voltage code is added to model code.

For order codes and details of manifolds to ISO 5599-1 interface size 2 for use with these valves see pages VS 26.5-6

Spool valves and Linear slide valves Series VS26

Single manifolds ISO 2 Interface



1. General description

A range of side ported manifolds for VS26 series valves.

Available with 1/4", 3/8" or 1/2" BSP inlet, outlet or exhaust ports, and 1/8" BSP pilot ports.

2. Model code

		Inlet	Outlet	Exhaust	Pilot
482837	ISO 2 Side ported BSP	G3/8"	G3/8"	G3/8"	G1/8"
482838	ISO 2 Side ported BSP	G1/2"	G1/2"	G1/2"	G1/8"
806146	ISO 2 Side ported BSP	G1/4"	G1/4"	G1/4"	G1/8"

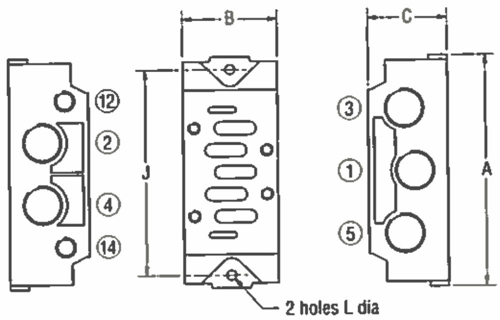
3. Operating data

All operating data for manifold units is consistent with that for the relevant valves mounted onto the manifold.

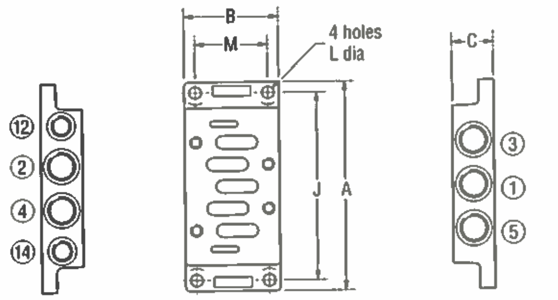
Mass	482837	0.570kg (1.26lb)
	482838	0.530kg (1.17lb)
	806146	0.370kg (0.81lb)

4. Installation dimensions in mm (inches)

482837, 482838



806146



Model code	A	B	C	J	Ldia	M
482837	124(4.88)	56 (2.20)	40 (1.57)	112(4.41)	5.5 (0.22)	
482838	124(4.88)	56 (2.20)	40 (1.57)	112(4.41)	5.5 (0.22)	
806146	112(4.41)	50 (1.97)	22 (0.87)	100(3.97)	6.5 (0.26)	38 (1.50)

***Note:** All drawings on this page are reproduced to a scale of 0.25 (Copy 4 times at 141% to give full size).*

5. Ordering procedure

Order in accordance with model codes shown above to suit installation requirements for valves.

VICKERS

Pneumatics

Spool valves and Linear slide valves Series VS26

Gang manifolds ISO 2 interface

1. General description

Side and base ported gang manifold bases for VS26 series valves to provide 2 to 8 station assemblies.

End plates are supplied in pairs with left hand plate end ported 1/2" BSP for exhaust connections and right hand plate end ported 1/2" BSP for inlet connection.

Manifold station units are base ported 3/8" BSP for outlet connections and base and side ported 1/8" BSP for pilot connections.

2. Model code

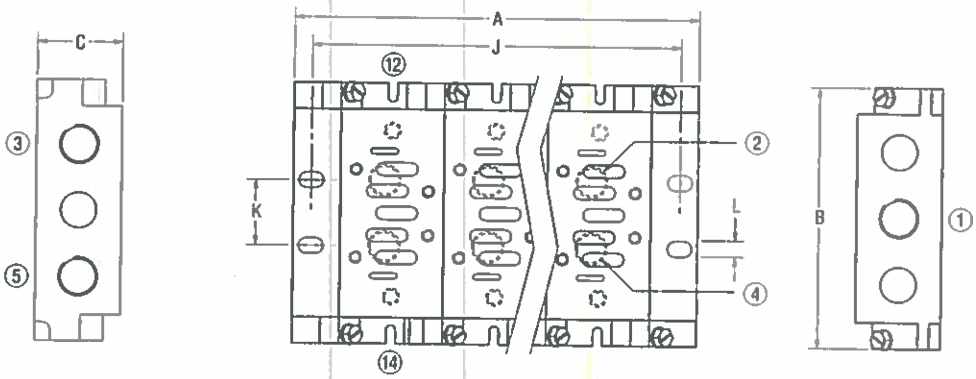
		Inlet Port 1	Outlet Ports 2&4	Exhaust Ports 3&5	Pilot Ports 12&14
482839	ISO 1 Manifold station BSP		G3/8"		G1/8"
482840	End plates (pair) BSP	G1/2"(RH)		G1/2"(LH)	

3. Operating data

All operating data for manifold units is consistent with that for the relevant valves mounted onto the manifold.

Mass	482839	0.440kg (0.97lb)
	482840	0.470kg (1.04lb)

4. Installation dimensions in mm (inches)



A	B	C	J	K	L
N x 56 (2.20) + 48 (1.89)	140 (5.51)	45 (1.77)	N x 56 (2.20) + 28 (1.10)	35 (1.38)	8.0 (0.31)

Note: All drawings on this page are reproduced to a scale of 0.25 (Copy 4 times at 141% to give full size).

N = Number of stations

5. Ordering procedure

Order in accordance with model codes shown above to suit installation requirements for valves.

i.e. For 6 station assembly
Order 6 off 482839
and 1 off 482840

The manifold stations are supplied with integral gaskets and necessary inter connecting screws and blanking plugs.

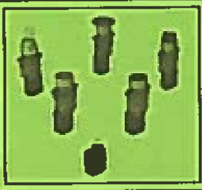
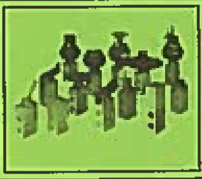
Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

GB-P5011-0195

APPROVED TO BS EN ISO 9001 QUALITY STANDARD CERTIFICATE No. Q10705

MANUAL and MECHANICALLY ACTUATED VALVES

Poppet valves

		Series	Function	Port size	Cv	Flow to atmosphere	Page numbers
Miniature poppet valves		VPM	3/2	M5 G1/8"	0.175	4.8 dm³/sec	VPM 1.1 VPM 1.2 VPM 1.3 VPM 1.4
Miniature pilot / poppet valves		VP13C	3/2 N/O 3/2 N/C	G1/8"	0.217	7.7 dm³/sec	VP13.1 VP13.2 VP13.3 VP13.4 VP13.5 VP13.6

Slide valves

		Series	Function	Port size	Cv	Flow to atmosphere	Page numbers
Semi rotary slide valves		VRP13 VR25	4/2 4/3	G1/8" G1/4"	0.19 0.38	6 dm³/sec 17 dm³/sec	VR25.1 VR25.2 VR25.3 VR25.4
		VR50	4/2 4/3	G1/2"	1.82	68 dm³/sec	VR50.1 VR50.2

VICKERS

Pneumatics

APPROVED TO BS EN ISO 9001 QUALITY STANDARD CERTIFICATE No. Q10706

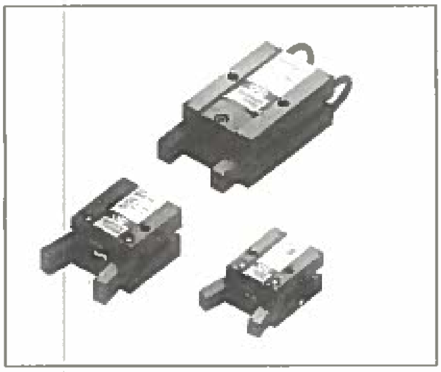
MANUAL and MECHANICALLY ACTUATED VALVES

SECTION 3

The Power in Automation

CKD Air grippers

Double acting and single acting
FH100 series (parallel type) and FH500 series (fulcrum type)
10, 12, 16, 20, 25mm bore



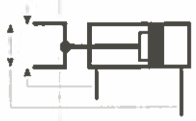
1. General description and application benefits

Slim, lightweight double acting or single acting air grippers ("Feather Hand") available in parallel or fulcrum operating versions.

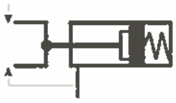
- Lightweight.
- Wide stroke (jaw opening).
- High gripping force.
- Selectable mounting options.
- Magnetic piston standard.
- Small switches fit within body envelope.
- Back-lash prevention mechanism.
- Internal cushion.

2. Functional symbols

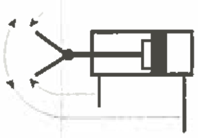
Parallel type
Double acting



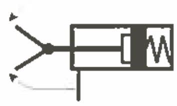
Parallel type
Single acting



Fulcrum type
Double acting



Fulcrum type
Single acting



For further technical information request catalogue ref CC-N-291

3. Model code

F H * * * - *
[1] [2] [3]

[1] **Type**
1 = Parallel type
5 = Fulcrum type

[2] **Bore**
10 = 10mm
12 = 12mm
16 = 16mm
20 = 20mm
25 = 25mm (Parallel type only)

[3] **Operation**
D = Double acting
O = Single acting (Normally open)

Preferred model selection

Parallel type - Double acting

Bore	Model code
10mm	FH110 - D
12mm	FH112 - D
16mm	FH116 - D
20mm	FH120 - D
25mm	FH125 - D

Parallel type - Single acting

Bore	Model code
10mm	FH110 - O
12mm	FH112 - O
16mm	FH116 - O
20mm	FH120 - O
25mm	FH125 - O

Fulcrum type - Double acting

Bore	Model code
10mm	FH510 - D
12mm	FH512 - D
16mm	FH516 - D
20mm	FH520 - D

Fulcrum type - Single acting

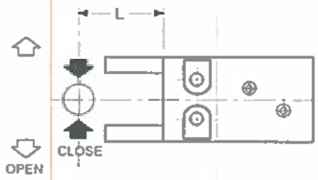
Bore	Model code
10mm	FH510 - O
12mm	FH512 - O
16mm	FH516 - O
20mm	FH520 - O

4. Operating data

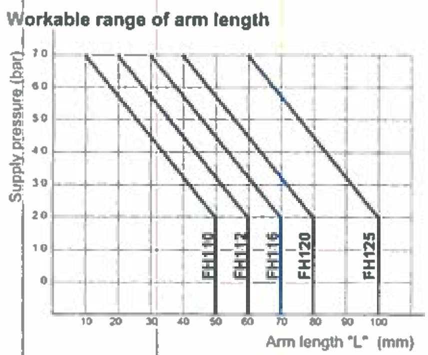
Operating pressure	Double acting 1.5 - 7.0 bar (21.3 - 100 psig) Single acting 2.5 - 7.0 bar (35.5 - 100 psig)
Ambient operating temperature range	+5° C to + 60° C (+41° F to + 140° F)
Type of connection	Screwthread - M3 (10mm and 12mm bore) Screwthread - M5 (16 mm to 25mm bore)
Materials of construction	Cylinder body and cover - Anodised aluminium alloy Piston - Stainless steel Gripper jaws - Steel Seals - Nitrile rubber
Cushioning	Fixed rubber buffer at open end of travel
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil.
Maximum operating frequency	3 cycles/sec
Repeatability	±0.03mm
Open / close movement	Parallel type - stroke 10mm bore - 8mm 12mm bore - 11mm 16mm bore - 14mm 20mm bore - 17mm 25mm bore - 20mm Fulcrum type - Angle 10mm to 20mm bore 20° at open, -5° at close
Technical data	See page FH 1.2
Installation dimensions	See page FH 1.3
Magnetic sensors	See page FH 2.1
Mass *Note: Mass shown excludes magnetic sensors. Switch mass = 0.052kg.*	FH110-* 0.051kg FH112-* 0.071kg FH116-* 0.124kg FH120-* 0.176kg FH125-* 0.284kg FH510-* 0.043kg FH512-* 0.053kg FH516-* 0.092k FH520-* 0.135kg
Service kits	Contact Customer Services Department

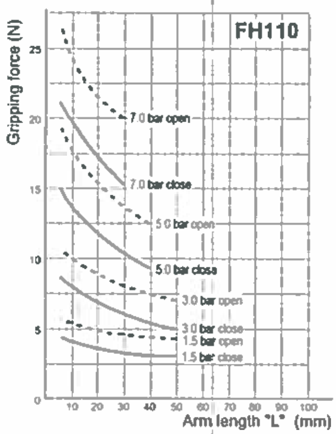
5. Technical data

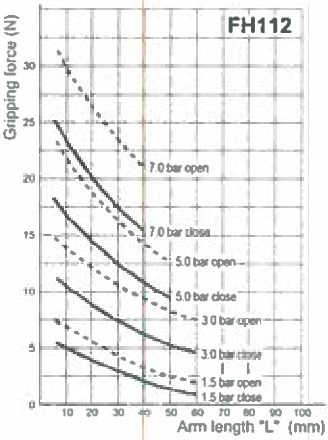
Parallel type - Gripping force for open and close operation at "L" length of gripper arm for supply pressures from 1.5 to 7 bar

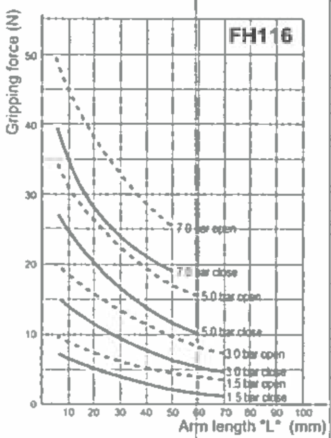


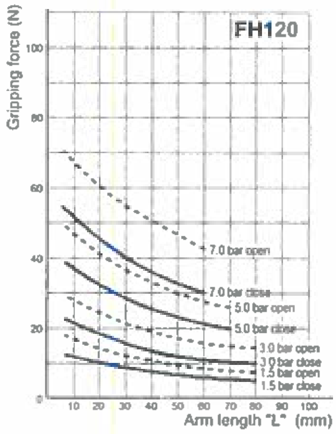
Note:
Gripping force for CLOSE operation of single acting models is 25% to 30% less than that of double acting models.

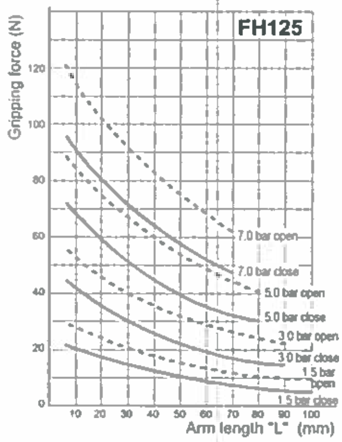




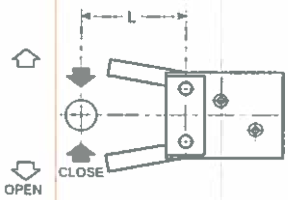




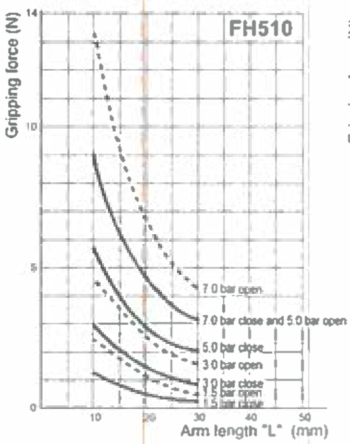


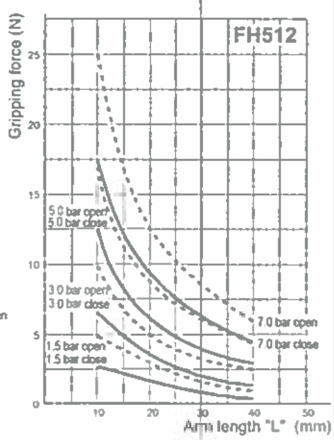


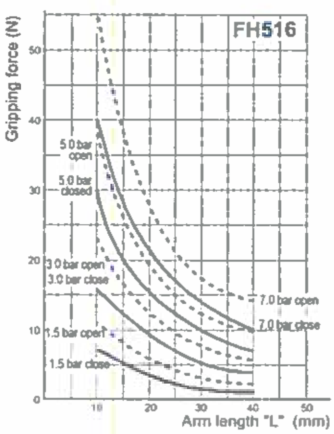
Fulcrum type - Gripping force for open and close operation at "L" length of gripper arm for supply pressures from 1.5 to 7 bar

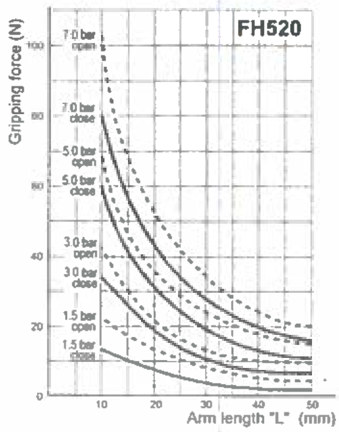


Note:
Gripping force for CLOSE operation of single acting models is 25% to 30% less than that of double acting models.



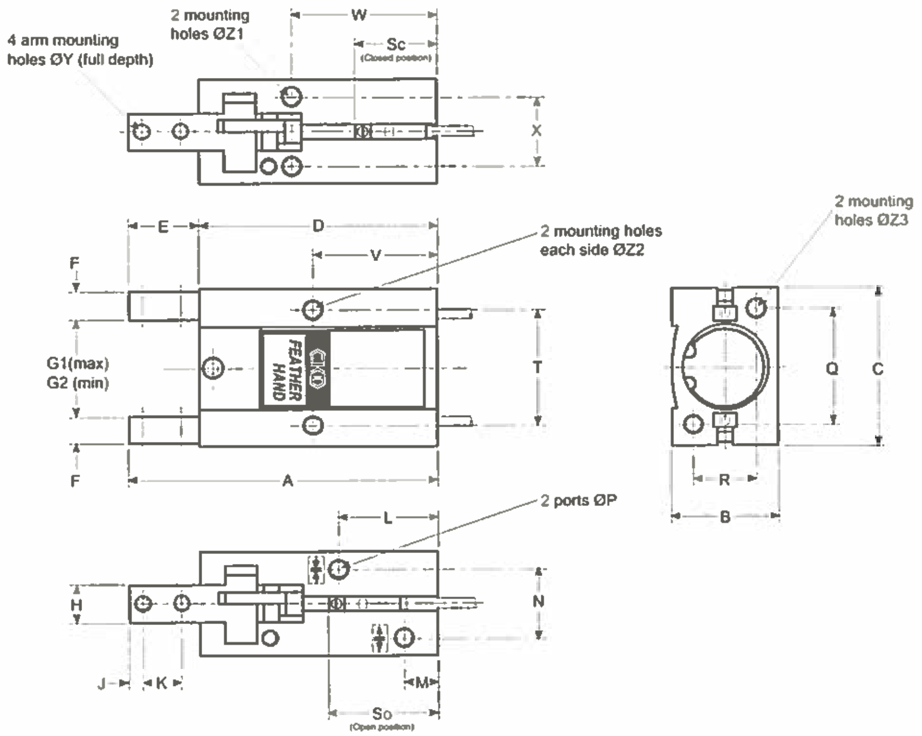






6. Installation dimensions in mm

FH110-*, FH112-*, FH116-*, FH120-*, FH125-*

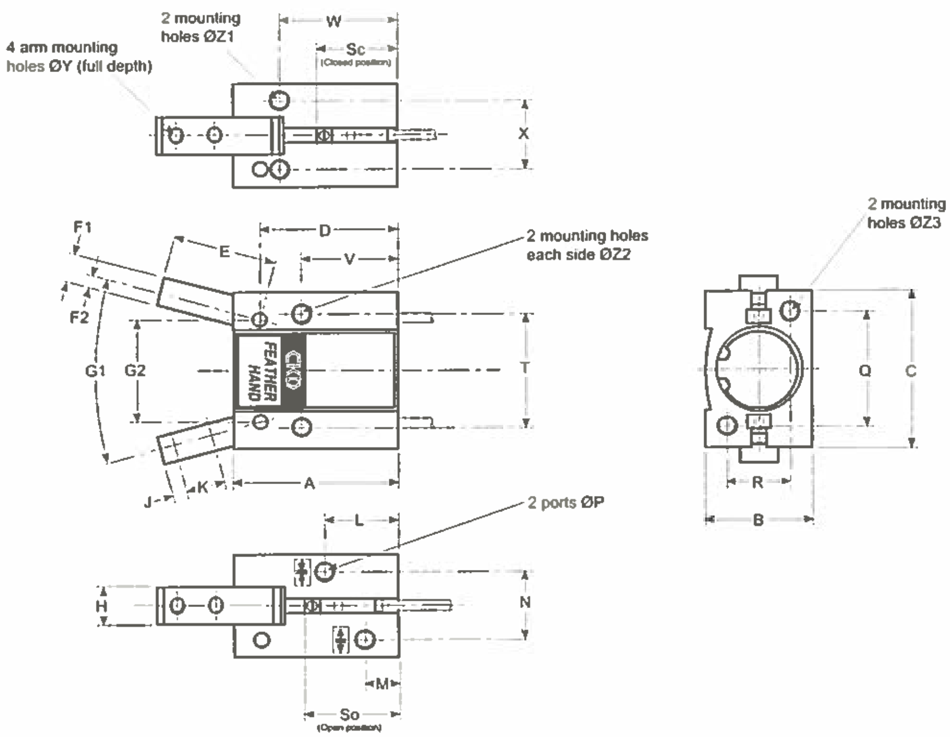


Magnetic sensor positions

Bore	Proximity Switch T3H So	Sc
10	23	19
12	25.5	19.5
16	25	19.5
20	27.5	20
25	30.5	21

Bore	A	B	C	D	E	F	G1	G2	H	J	K	L	M	N	P	Q	R	T	V	W	X	Y	Z1	Z2	Z3
10	59	16	23	44	15	5.5	12	4	7	3	8	18	7.5	10.5	M3	16	9.5	17	22	25.5	11	M3	M3 x 6deep	M3 x 4.5deep	M3 x 6deep
12	64	18	27	49	15	6	15	4	7	3	8	20	7.5	12.5	M3	20	11	19	24	29	12	M3	M3 x 6deep	M3 x 5.5deep	M3 x 6deep
16	71	23	34	53	18	6.5	20	6	10	4	10	21	8	15	M5	24	14	26	26	31	15	M4	M4 x 8deep	M4 x 8deep	M4 x 8deep
20	78	26	40	60	18	7.5	24	7	10	4	10	24.5	8.5	17	M5	29	16	29	30.5	36	17	M4	M5 x 10deep	M5 x 9.5deep	M5 x 10deep
25	91	31	45	71	20	8.5	26	6	12	5	10	30	10	21	M5	34	21	34	37	43	21	M5	M5 x 10deep	M5 x 12.5deep	M5 x 10deep

FH510-*, FH512-*, FH516-*, FH520-*



Magnetic sensor positions

Bore	Proximity Switch T3H So	Sc
10	21.5	19.5
12	21	19
16	22	19.5
20	23.5	20.5

Bore	A	B	C	D	E	F1	F2	G1	G2	H	J	K	L	M	N	P	Q	R	T	V	W	X	Y	Z1	Z2	Z3
10	33.5	16	23	28.5	21	5.5	1.5	-5° to +20°	15	7	3	8	16	8	10.5	M3	16	9.5	17	20	24	11	M3	M3 x 6deep	M3 x 4.5deep	M3 x 6deep
12	33.5	18	27	28.5	21	6	2	-5° to +20°	17	7	3	8	16	8	12	M3	20	11	19	20	24	12	M3	M3 x 6deep	M3 x 5.5deep	M3 x 6deep
16	35	23	34	30	24	6.5	2.5	-5° to +20°	22	10	4	10	16	8	15	M5	24	14	26	21	25.5	15	M4	M4 x 8deep	M4 x 8deep	M4 x 8deep
20	41.5	26	40	34.5	26	7.5	2.5	-5° to +20°	26	10	4	10	18.5	8.5	17	M5	29	16	29	24	29.5	17	M5	M5 x 10deep	M5 x 9.5deep	M5 x 10deep

CKD Air grippers

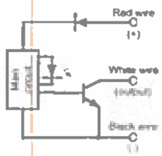
Magnetic sensors - Proximity switch Type T3H
10, 12, 16, 20, 25mm

1. General description and application benefits

Continuously rated proximity switches with LED indicator and flying lead. Programmable controller relay operation.

- Switches fit within air gripper envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagram of switch



3. Preferred model selection

Proximity switch

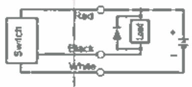
Model code	Description
T3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
T3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

4. Operating data

Ambient operating temperature range	-10°C to + 60°C (14 F to + 140° F)
Load voltage/current	30vDC or less/100mA or less
Power consumption	24vDC (ON) 10mA or less
Internal voltage drop	0.5v or less at 100mA
Leakage current	10 µA or less
Maximum impulse	100G
Protection	IEC standard IP67
Lead wire	Oil proof 3 core vinyl cabtyre cord 0.2mm²
Insulation resistance	More than 20MΩ at 500v DC megger
LED indication	Red (ON)

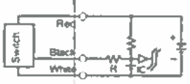
5. Installation requirements

Output circuit protection



Example of surge absorbing element (diode) jointly used as the inductive load. Use Hitachi diode VO6 or equivalent

When an inductive load (relay or solenoidvalve) is connected, be sure to install the protection circuit shown left in order to protect from the surge voltage generated when the switch isturned OFF.

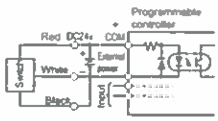


Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0.10 = R (Ω)

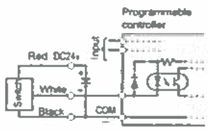
When a capacitive load (condenser) is connected, be sure to install the protection circuit shown left in order to protect from the inrush current generated when the switch is turned ON.

Connection to programmable controller (sequencer)

The connecting method differs according to the type of programmable controller.
Make connections as shown below.

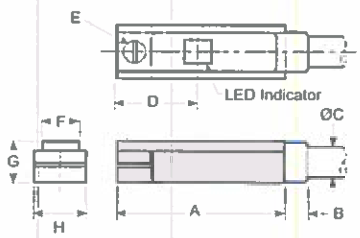


Example of switch T3H connection to source input (external power) type.*



Example of switch T3H connection to source input (built - in power) type. The switch cannot be connected to the sink input sequencer*

6. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	H
T3H*	18.5	2.5	3.4	9	M2.5	4.5	4.7	6

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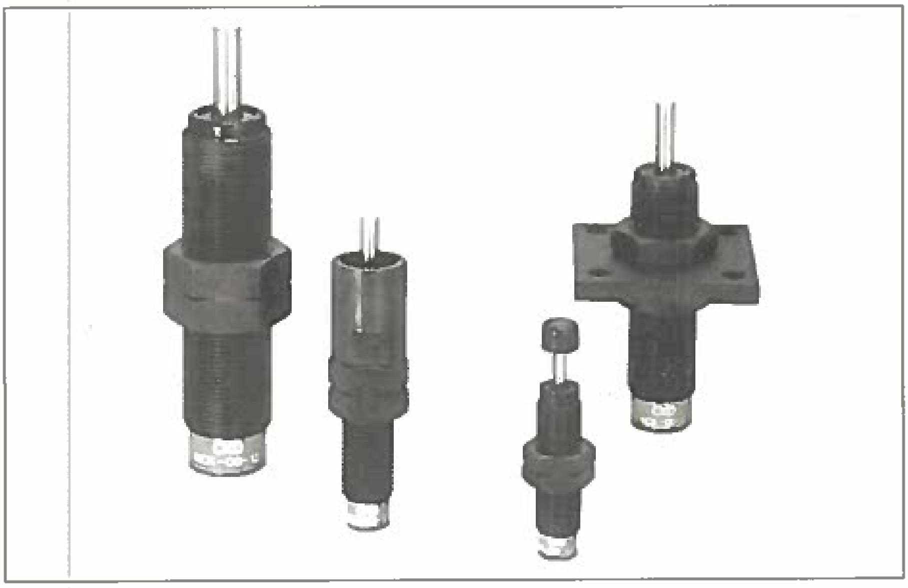
Printed in Great Britain

GB-P5038-0494

CKD shock absorbers Series NCK

Absorption energy
0.7 to 20 kgf.m (6.9 to 196 Nm)



1. General description and application benefits

A range of high performance non adjustable shock absorbers of compact, slim design.

- 'Soft' stop of moving objects.
- Ease of installation.
- Extends life of machinery and equipment.
- Improves environment of machinery and equipment and reduces noise.
- Automatic adjustment to optimum absorption performance.

2. Model code

N C K - * * - * * * - * *

[1] (* *) [2] (* * *) [3] (* *)

[1] Mounting style
00 = Standard
FA = Flange

[2] Series
Mark relates to maximum absorption energy - see preferred model selection table below

[3] Option
C = Equipped with end cap (standard)
N1 = Equipped with stop nut
No mark = Without end cap

Preferred model selection and specification

Standard model	Max absorption energy kgf·m(Nm)	Stroke mm	Max absorption energy per hour kgf·m/hr (Nm/hr)	Max speed of impact m/sec	Max repeat frequency cycle/min	Return spring force fully compressed kgf	Return time sec	Mass kg
NCK-00-0.7-C	0.7 (6.87)	8	1260 (12361)	1.5	30	0.44	0.3 or less	0.02
NCK-00-1.2-C	1.2 (11.77)	10	2160 (21190)	2.0	30	0.60	0.3 or less	0.04
NCK-00-2.6-C	2.6 (25.50)	15	3900 (38259)	2.0	25	1.20	0.3 or less	0.07
NCK-00-7-C	7.0 (68.67)	20	8400 (82404)	2.5	20	2.20	0.4 or less	0.20
NCK-00-12-C	12.0 (117.72)	25	8640 (84758)	3.0	12	3.40	0.4 or less	0.30
NCK-00-20-C	20.0 (196.20)	30	10800 (105948)	3.0	9	3.50	0.5 or less	0.45

Ambient operating temperature range -10°C to + 80°C (14°F to 176°F)

Ordering examples:-
NCK-00-0.7-C = Shock absorber (with end cap) for standard fitting having maximium absorption energy of 0.70 kgf·m
NCK-FA-12-N1 = Shock absorber with flange mounting having maximum absorption energy of 12 kgf·m and fitted with a stop nut

Notes:

(1) 1kg = 9.81 Newtons (N)

(2) Maximum absorption energy per hour is taken at an ambient temperature of 20°C (68°F)
Maximum absorption energy per hour (Et) at ambient temperature t°C is expressed as follows

$$Et = \frac{(80 - t)}{60} \times Eh$$

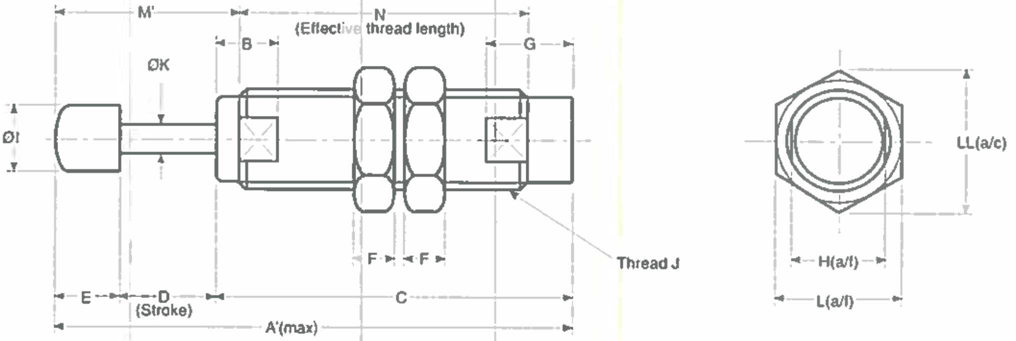
where Et = Maximum absorption energy per hour (kgf·m/hr) at ambient temperature t°C
t = Ambient temperature t°C
Eh = Maximum absorption energy per hour (kgf·m/hr) at ambient temperature 20°C (68°F)

(3) Minimum absorption energy should be greater than 1/5 of the maximum absorption energy.

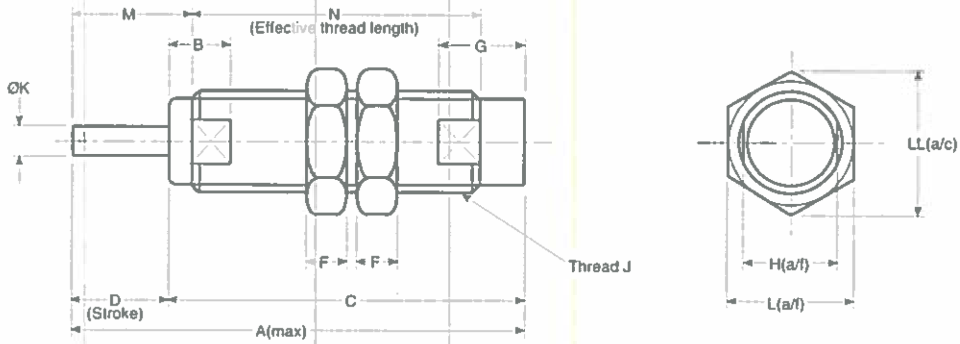
*(4) For "Calculations for selecting shock absorbers" see pages SCK 1.2 and SCK 1.3 of **SCK Series Shock Absorbers catalogue.***

6. Installation dimensions in mm

NCK - 00 - * * * - C

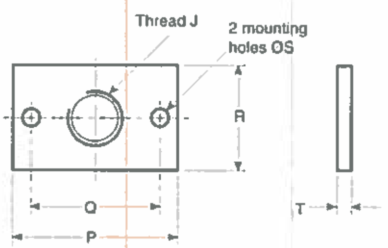


NCK - 00 - * * *

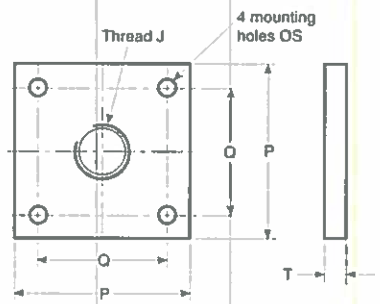


Flange (FA)

For models ***NCK-FA-0.7***
NCK-FA-1.2

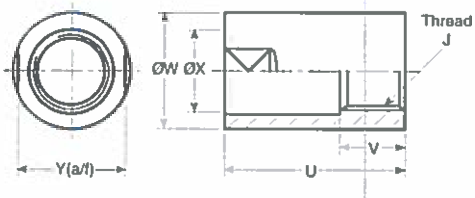


For models ***NCK-FA-2.6, NCK-FA-7***
NCK-FA-12, NCK-FA-20



Stop nut (N1)

For all models



Mark	Standard (00)																	Flange (FA)					Stop nut (N1)				
Model Number	A	A'	B	C	D	E	F	G	H	I	J	K	L	LL	M	M'	N	P	Q	R	S	T	U	V	W	X	Y
NCK-00-0.7	50	57	7.5	42	8	7	4	9	9	8	M10x1.0	3	14	16.2	13	20	31	42	30	20	5.5	2.5	17	10	15	11	13
NCK-00-1.2	57.5	65	8.5	47.5	10	7.5	5	11	11	10	M12x1.0	3.5	17	19.6	15	22.5	35.5	46	34	20	5.5	3.6	23	10	19	13	17
NCK-00-2.6	86	96	10.5	71	15	10	8	14	13	12	M14x1.5	5	19	21.9	20	30	58	52	38		6.5	6	26.5	10	20	15	17
NCK-00-7	98.5	109.5	12.5	78.5	20	11	8	18	19	16	M20x1.5	6	27	31.2	25	36	63.5	52	38		6.5	6	36.5	15	26	21	24
NCK-00-12	129	142	15.5	104	25	13	10	23	24	22	M25x1.5	8	32	37	30	43	87	52	38		6.5	6	35	15	32	26	30
NCK-00-20	141	154	15.5	111	30	13	10	25	24	22	M27x1.5	8	32	37	35	48	92	52	38		6.5	6	45.5	15	35	28	32

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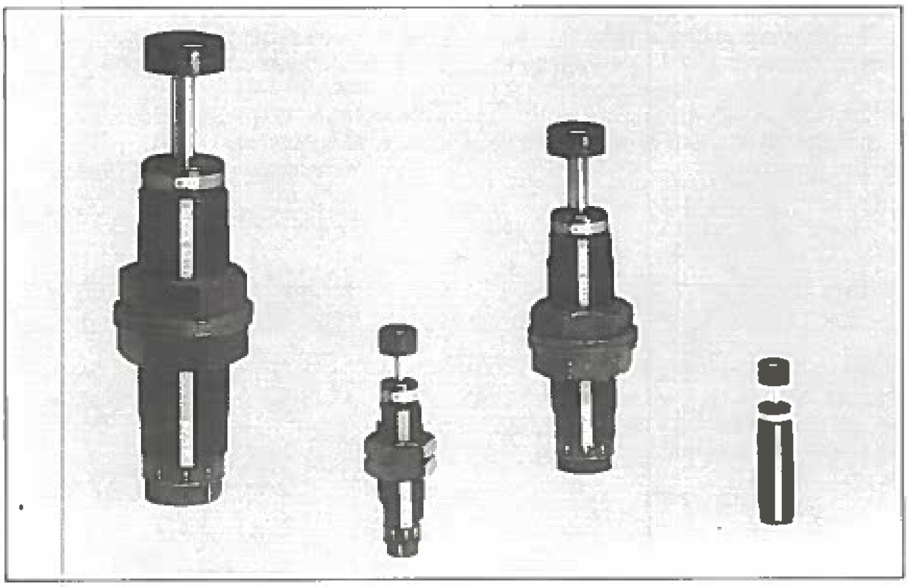
Printed in Great Britain

GB-P5034-NCK-0394

CKD shock absorbers Series SCK

Absorption energy 0.005 to 60 kgf.m (0.049 to 588 Nm)



1. General description and application benefits

A range of high performance adjustable shock absorbers having a unique mechanism that converts kinetic energy of a moving object to thermal energy which is diffused into the atmosphere.

- Stops moving objects safely.
- Increases manufacturing cycles.
- Extends life of machinery and equipment.
- Improves environment of machinery and equipment and reduces noise.
- Shock absorption capacity adjustable on 11 models.

2. Model code

S C K - * * - * * * * * - * *

[1] [2] [3]

[1] Mounting style
00 = Standard
FA = Flange

[2] Series
Mark relates to maximum absorption energy - see preferred model selection table below

[3] Option
No mark = Standard
N1 = Equipped with stop nut

Preferred model selection and specification

Standard model	Max absorption energy kgf·m (Nm)	Stroke mm	Max absorption energy per hour - kgf·m/hr (Nm/hr)	Max speed of impact - m/sec	Max repeat frequency cycle/min	Required bracket strength - kgf	Return time sec	Mass kg
SCK-00-0.005	0.005 (0.049)	7	13.5 (132.3)	1.0	45	1.5	0.3 or less	0.02
SCK-00-0.01	0.01 (0.098)	10	27 (264.6)	1.0	45	2	0.3 or less	0.04
SCK-00-0.03	0.03 (0.294)	10	81 (793.8)	1.0	45	6	0.3 or less	0.07
SCK-00-0.3	0.3 (2.94)	10	810 (7938)	1.0	45	60	0.4 or less	0.2
SCK-00-0.6	0.6 (5.88)	10	1080 (10584)	1.5	30	120	0.4 or less	0.2
SCK-00-1.2	1.2 (11.76)	15	2160 (21168)	2.0	30	160	0.4 or less	0.32
SCK-00-2.6	2.6 (25.48)	15	3900 (38220)	2.0	25	350	0.4 or less	0.32
SCK-00-6.5	6.5 (63.7)	25	7800 (76440)	2.5	20	520	0.5 or less	0.63
SCK-00-8	8.0 (78.4)	25	8640 (84672)	2.5	18	640	0.5 or less	0.63
SCK-00-12	12.0 (117.6)	25	8640 (84672)	3.0	12	960	0.5 or less	1.17
SCK-00-20	20.0 (196.0)	40	10800 (105840)	3.0	9	1000	0.6 or less	1.25
SCK-00-30	30.0 (294.0)	60	12600 (123480)	3.0	7	1000	0.6 or less	1.39
SCK-00-40	40.0 (392.0)	70	12000 (117600)	3.0	5	1150	0.6 or less	1.45
SCK-00-60	60.0 (588.0)	70	14400 (141120)	4.0	4	1700	0.6 or less	2.05

Ambient operating temperature range
-10°C to + 80°C (14°F to 176°F)

Ordering examples:- SCK-00-0.03 = Shock absorber for standard fitting having maximium absorption energy of 0.03 kgf·m
SCK-FA-8-N1 = Shock absorber with flange mounting having maximium absorption energy of 8 kgf·m and fitted with a stop nut

Notes:

(1) 1kg = 9.81 Newtons (N)

(2) Model numbers SCK-00-0.005, SCK-00-0.01 and SCK -00 0-03 are spring return without adjuster.

(3) Model numbers SCK-00-0.3 to SCK-00-60 inclusive are spring return with adjuster.

(4) Maximum absorption energy per hour is taken at an ambient temperature of 20°C (68°F)
Maximum absorption energy per hour (Et) at ambient temperature t°C is expressed as follows

$$Et = \frac{(80 - t)}{60} \times Eh$$

where Et = Maximum absorption energy per hour (kgf·m/hr) at ambient temperature t°C
t = Ambient temperature t°C
Eh = Maximum absorption energy per hour (kgf·m/hr) at ambient temperature 20°C (68°F)

(5) Minimum absorption energy should be greater than 1/5 of the maximum absorption energy.

3. Calculations for selecting shock absorbers

The following conditions of operation need to be determined before making the selection

A) Weight of load (kgf)
B) Instantaneous speed of impact on hitting the shock absorber (m/sec)
C) Thrust of any external force that may be added to the load (kgf)

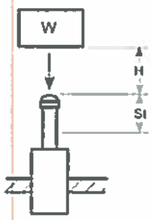
Symbols

L = Distance (m)
P = Operating pressure (kgf/cm^2)
I = Moment of inertia ($kgf{\cdot}m{\cdot}sec^2$)
F = Thrust (kgf)
H = Height (m)
F_p = Maximum stopping force (kgf)

D = Cylinder diameter (cm)
K = Radius (m) -distance from centre of load to centre of rotation
T = Torque (kgf·m)
St = Stroke of shock absorber (m)
t = Time (sec)

E = Kinetic energy (kgf·m)
ω = Rotational speed of impact (radian/sec)
V = Speed of impact (m/sec)
W = Weight of work (kgf)
g = Acceleration of gravity (m/sec^2)

Vertical falling movement (free fall)



$$E = W \cdot (H + St)$$

$$V = \sqrt{2g \cdot H}$$

Determine if shock absorber SCK-00-60 can be used when the weight of work (W) is 70 kgf and it falls vertically from a height (H) of 0.7m.

$$E = 70 \times (0.7 + 0.07)$$

$$= 53.9 \text{ kgf·m}$$

which is less than 60 kgf·m, the maximum absorption energy of SCK-00-60.

Then determine the maximum speed of impact (V) under the same condition.

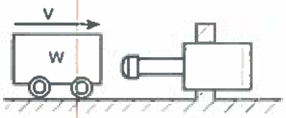
$$V = \sqrt{2 \times 9.8 \times 0.7}$$

$$= 3.7 \text{ m/sec}$$

which is less than 4 m/sec, the maximum speed of impact for SCK-00-60

This proves that the energy can be absorbed by SCK-00-60

Horizontal movement (inertia movement)



$$E = \frac{1}{2g} \cdot W \cdot V^2$$

Determine if shock absorber SCK-00-1.2 can be used when the weight of work (W) is 70 kgf and the speed of impact (V) is 0.5 m/sec.

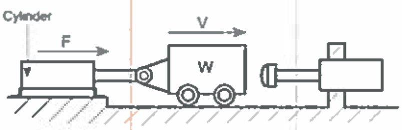
$$E = \frac{1}{2 \times 9.8} \times 70 \times (0.5)^2$$

$$= 0.89 \text{ kgf·m}$$

which is less than 1.2 kgf·m, the maximum absorption energy of SCK-00-1.2.

This proves that the energy can be absorbed by SCK-00-1.2

Horizontal movement (with an addition of thrust)



$$E = \frac{1}{2g} \cdot W \cdot V^2 + F \cdot St$$

Determine if shock absorber SCK-00-6.5 can be used when the work used in the calculation above is moved by a pneumatic cylinder having a diameter (D) of 6.3cm and air pressure (P) of 5 kgf/cm^2.
Thrust of the pneumatic cylinder is:-

$$F = \frac{\pi}{4} \times D^2 \times P$$

$$= \frac{\pi}{4} \times 6.3^2 \times 5$$

$$= 155 \text{ kgf}$$

Now determine if SCK-00-6.5 can be used under this condition.

$$E = \frac{1}{2 \times 9.8} \times 70 \times (0.5)^2 + 155 \times 0.025$$

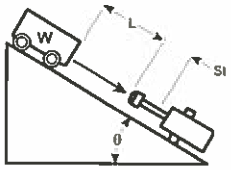
$$= 4.8 \text{ kgf·m}$$

which is less than 6.5 kgf·m, the maximum absorption energy of SCK-00-6.5.

This proves that the energy can be absorbed by SCK-00-6.5

3. Calculations for selecting shock absorbers (cont)

Falling movement on a slope



$$E = W \cdot (L + St) \cdot \sin\theta$$

$$V = \sqrt{2g \cdot H}$$

Determine if shock absorber SCK-00-40 can be used when the weight of work (W) is 70 kgf and it falls a distance (L) of 0.5m down a slope (θ) of 30⁰.

$$E = 70 \times (0.5 + 0.07) \times \sin 30^0$$
$$= 19 \text{ kgf·m}$$

which is less than the 20 kgf·m maximum absorption energy of an SCK-00-20 shock absorber.

Then determine the maximum speed of impact (V) under the same condition.

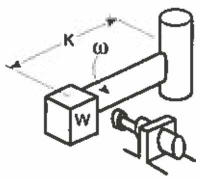
$$V = \sqrt{2g \times H} \quad \text{where } H = L \times \sin\theta$$

$$V = \sqrt{2 \times 9.8 \times 0.5 \times \sin 30^0}$$
$$= 2.2 \text{ m/sec}$$

which is less than 3 m/sec, the maximum speed of impact for SCK-00-20

This proves that an SCK-00-20 can be used to absorb this energy

Horizontal rotational movement (inertia movement)



$$I = \frac{W \cdot K^2}{g}$$

$$E = \frac{I \cdot \omega^2}{2}$$

Determine if shock absorber SCK-00-1.2 can be used when the weight of work (W) is 70 kgf rotating on a radius (K) of 0.5m and the rotational speed of impact (ω) is 1 radian/sec.

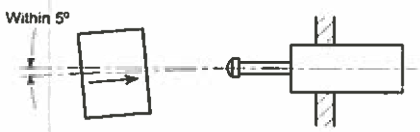
$$I = \frac{70 \times (0.5)^2}{9.8}$$
$$= 1.8 \text{ kgf·m·sec}^2$$

$$E = \frac{1.8 \times (1)^2}{2}$$
$$= 0.9 \text{ kgf·m}$$

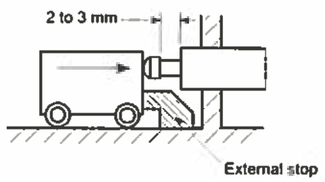
which is less than 1.2 kgf·m, the maximum absorption energy of SCK-00-1.2.

This proves that the energy can be absorbed by SCK-00-1.2

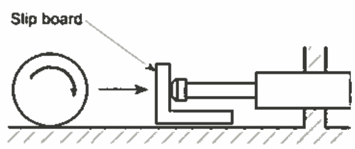
4. Installation precautions



The shock absorber must be aligned accurately so that the moving object hits the centre of its rod. The direction of movement of the object must coincide with that of the of the rod axis within 5⁰ impact angle.



An external stop or stop nut must be installed about 2 to 3mm in front of the stroke end to protect the shock absorber, especially when a thrust is added to the object or when an object falls vertically.



When the moving object is rotating use of a slip board etc. is required in front of the rod so that the rotating force is not conveyed to the rod.

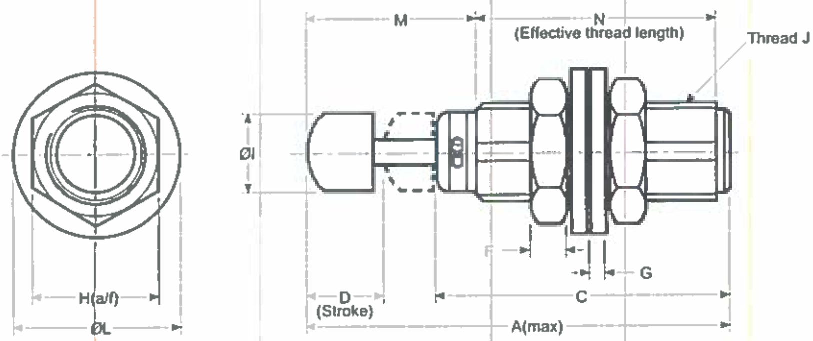
NOTE: The piston rod must be kept free of scratches or foreign materials.

5. Typical applications

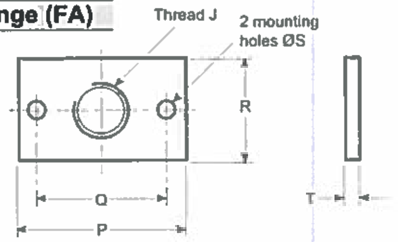
- **Packaging devices:**
  Index heads, turntables, conveyors.
- **Machine rooms:**
  Carriages, stoppers.
- **Machine tools:**
  Drill feeds, welders, press feeds, die stoppers, indexing tables.
- **Automotive:**
  Press welders, press feeds, welding jigs, transfer shuttles.
- **Tyre manufacture:**
  Tyre manufacturing machines, bias cutters
- **Foundries:**
  Mould line, core automation.

6. Installation dimensions in mm

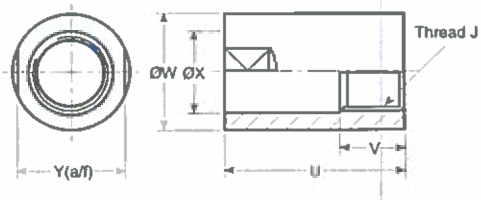
SCK-00-0.005, SCK-00-0.01, SCK-00-0.03



Flange (FA)

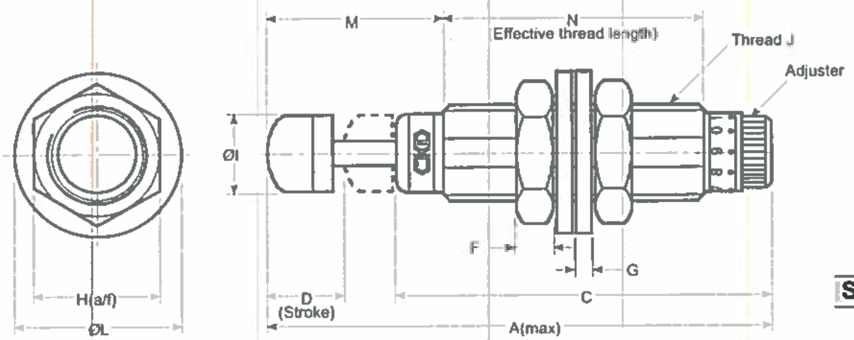


Stop nut (N1)

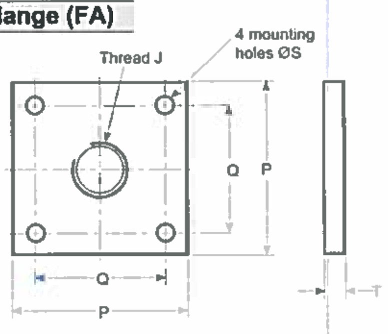


Mark	Standard (00)											Flange (FA)					Stop nut (N1)				
Model Number	A	C	D	F	G	H	I	J	L	M	N	P	Q	R	S	T	U	V	W	X	Y
SCK-00-0.005	41.5	27	7	4	2	14	8	M10x1.0	18	21	19	42	30	20	5.5	2.5	22	10	15	11	13
SCK-00-0.01	55	37	10	5	2.5	17	10	M12x1.0	21	25.5	28	46	34	20	5.5	3.6	28	10	19	13	17
SCK-00-0.03	70	50	10	6.5	2.5	22	14	M16x1.0	27	28	40	52	40	32	5.5	4.5	38	10	22	17	19

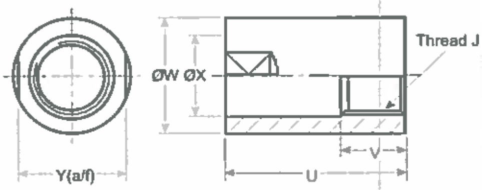
SCK-00-0.3, SCK-00-06, SCK-00-1.2, SCK-00-2.6, SCK-00-6.5, SCK-00-8, SCK-00-12, SCK-00-20, SCK-00-30, SCK-00-40, SCK-00-60



Flange (FA)



Stop nut (N1)



Note: ***Shock absorber adjustment***

If the impact force is not absorbered sufficiently with initial setting turn adjuster to an increased setting. The adjuster can rotate 360° but should not be increased more than is necessary. Excessive increase will result in longer operating time or stoppage in middle of operation.
The adjuster has a detent to prevent it from rotating and this detent must be engaged before the shock absorber is operated.

Mark	Standard (00)											Flange (FA)				Stop nut (N1)				
Model Number	A	C	D	F	G	H	I	J	L	M	N	P	Q	S	T	U	V	W	X	Y
SCK-00-0.3	94.3	72.3	10	8	2.9	27	16	M20x1.0	33	33.5	46	52	38	6.5	6	45	15	26	21	24
SCK-00-0.6	94.3	72.3	10	8	2.9	27	16	M20x1.0	33	33.5	46	52	38	6.5	6	45	15	26	21	24
SCK-00-1.2	121.6	92.6	15	10	2.9	32	22	M25x1.5	39	40.5	65	52	38	6.5	6	60	15	32	26	30
SCK-00-2.6	121.6	92.6	15	10	2.9	32	22	M25x1.5	39	40.5	65	52	38	6.5	6	60	15	32	26	30
SCK-00-6.5	155.8	116.3	25	12	3.6	41	27	M30x1.5	50	51.5	89	66	48	8.5	6	70	15	40	31	36
SCK-00-8	155.8	116.3	25	12	3.6	41	27	M30x1.5	50	51.5	89	66	48	8.5	6	70	15	40	31	36
SCK-00-12	174.6	132.6	25	16	3.6	50	36	M40x1.5	61	55.5	98.5	84	64	10.5	9	90	20	50	41	46
SCK-00-20	204.6	147.6	40	16	3.6	50	36	M40x1.5	61	70.5	113.5	84	64	10.5	9	90	20	50	41	46
SCK-00-30	256.1	179.1	60	16	3.6	50	36	M40x1.5	61	90.5	145	84	64	10.5	9	90	20	50	41	46
SCK-00-40	276.1	189.1	70	16	3.6	50	36	M40x1.5	61	100.5	155	84	64	10.5	9	90	20	50	41	46
SCK-00-60	295.8	207	70	18	4.5	55	42	M45x1.5	67	103	172.5	84	64	10.5	9	100	20	60	46	55

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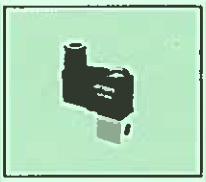
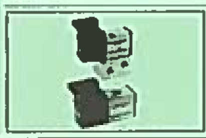
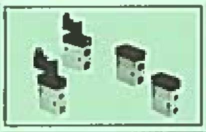
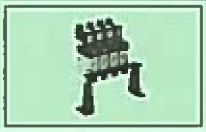
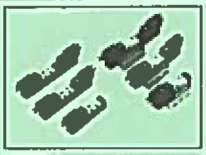
SOLENOID and AIR ACTUATED DIRECTIONAL CONTROL VALVES

Poppet valves

		Series	Function	Port size	Cv	Flow to atmosphere	Page numbers
Picosol poppet valves		3MAO 3MBO	3/2	M3, 4mm barb tube	0.005	0.83 dm³/sec	P3 1.1 P3 1.2
		M3MAO M3MBO Manifold systems for 2 to 20 stations	3/2	M3, M5 4mm push in			P3 2.1 P3 2.2
Solenoid pilot / poppet valves		VEM13D	3/2	G1/8"		1.00 dm³/sec	VEM 1.1 VEM 1.2
Direct acting poppet valves		3PA1 3PB1	3/2 N/O 3/2 N/C	M5 G1/8"	0.11	1.83 dm³/sec	3PA 1.1 3PA 1.2
		3PA2 3PB2	3/2 N/O 3/2 N/C	G1/8" G1/4"	0.28	4.66 dm³/sec	3PA 2.1 3PA 2.2
High flow poppet valves		VP25 VP50	2/2 N/O 2/2 N/C 3/2 N/O 3/2 N/C	G1/4" G1/2"	1.75 3.15	46 dm³/sec 83 dm³/sec	VP 1.1 VP 1.2 VP 1.3
		VP25 Feeder bar systems for 2 to 6 stations	3/2	G3/8"			VP 1.4

Spool valves

		Series	Function	Port size	Cv	Flow to atmosphere	Page numbers
Picosol spool valves		4SAO 4SBO	5/2 5/3	M3 M5	0.10 0.08	1.66 dm³/sec 1.33 dm³/sec	P4 1.1 P4 1.2 P4 2.1 P4 2.2
		M4SAO M4SBO Manifold systems for 2 to 20 stations	5/2 5/3	M3, M5 4mm push in			P4 1.3 P4 1.4 P4 2.3 P4 2.4

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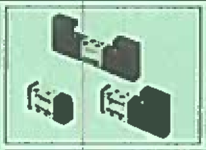
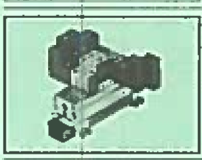
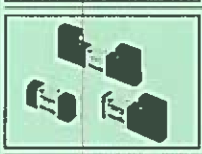
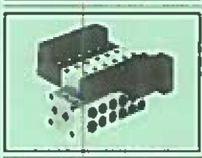
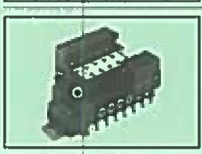
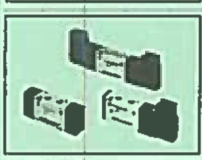
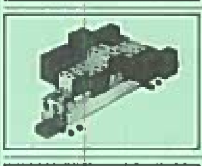
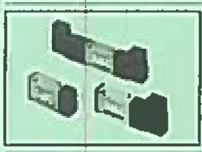
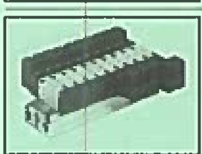
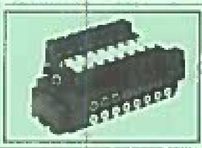
SOLENOID and AIR ACTUATED DIRECTIONAL CONTROL VALVES

Spool valves *(continued)*

		Series	Function	Port size	Cv	Flow to atmosphere	Page numbers
CKD Selex valves		3KA1 4KA1	3/2 5/2 5/3	M5 4mm push in	0.16	4.8 dm^3/sec	KAV 1.1 KAV 1.2 KAV 1.3
		M4KA1 Manifold systems for 1 to 20 stations and accessories including DIN rail mounting plates, interface supply and exhaust plates and pre wired solenoid leads		G1/8"			KAM 1.1 KAA 1.1
		4KB1	4/2 4/3	G1/8"	0.22	6.6 dm^3/sec	KBV 1.1 KBV 1.2 KBV 1.3
		M4KB1 Manifold systems for 1 to 20 stations and accessories including DIN rail mounting plates, interface supply and exhaust plates and pre wired solenoid leads		G1/8" M5 6mm push in			KBM 1.1 KBM 1.2 KBA 1.1
		MN4KB1 DIN rail mounting system of unlimited stations including end plates, supply and exhaust plates, intermediate supply and exhaust plates, rail sub plates and blocking plates		4, 6, 8mm push in			KBD 1.1 KBD 1.2 KBD 1.3
		4KA2	5/2 5/3	G1/8" 4, 6mm push in	0.68	20.4 dm^3/sec	KAV 2.1 KAV 2.2 KAV 2.3
		M4KA2 Manifold systems for 1 to 20 stations and accessories including DIN rail mounting plates, interface supply and exhaust plates and pre wired solenoid leads		G1/4"			KAM 2.1 KAA 2.1
		4KB2	5/2 5/3	G1/8" G1/4"	0.76	22.0 dm^3/sec	KBV 2.1 KBV 2.2 KBV 2.3
		M4KB2 Manifold systems for 1 to 20 stations and accessories including DIN rail mounting plates, interface supply and exhaust plates and pre wired solenoid leads		G1/4" G1/8" 6, 8mm push in			KBM 2.1 KBM 2.2 KBA 2.1
		MN4KB2 DIN rail mounting system of unlimited stations including end plates, supply and exhaust plates, intermediate supply and exhaust plates, rail sub plates and blocking plates		6, 8, 10mm push in			KBD 2.1 KBD 2.2 KBD 2.3

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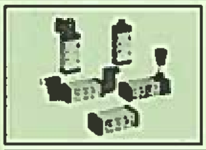
SOLENOID and AIR ACTUATED DIRECTIONAL CONTROL VALVES

Spool valves *(continued)*

		Series	Function	Port size	Cv	Flow to atmosphere	Page numbers
Reduced wire/serial transmission Selex valves		4TB1 4TB2	5/2 5/3	4, 6, 8mm push in 6, 8,10,12mm push in	0.36 0.79		4TB 1.1 4TB 1.2 4TB 1.3 4TB 1.4
		DIN rail mounting system of unlimited stations including end plates, supply and exhaust plates, intermediate supply and exhaust plates, blocking plates, terminal and connector blocks					
Spool valves		VS23	5/2 5/3	G1/4"	1.75 1.40	45 dm³/sec 34 dm³/sec	VS 23.1 VS 23.2 VS 23.3
		VS23		G3/8"			VS 23.4
		Feeder bar systems for 2 to 6 stations					

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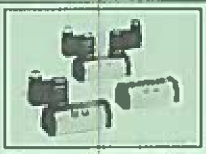
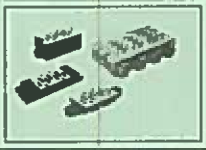
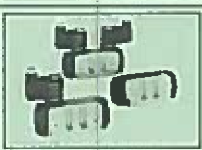
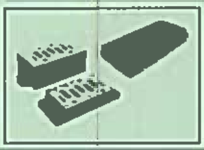
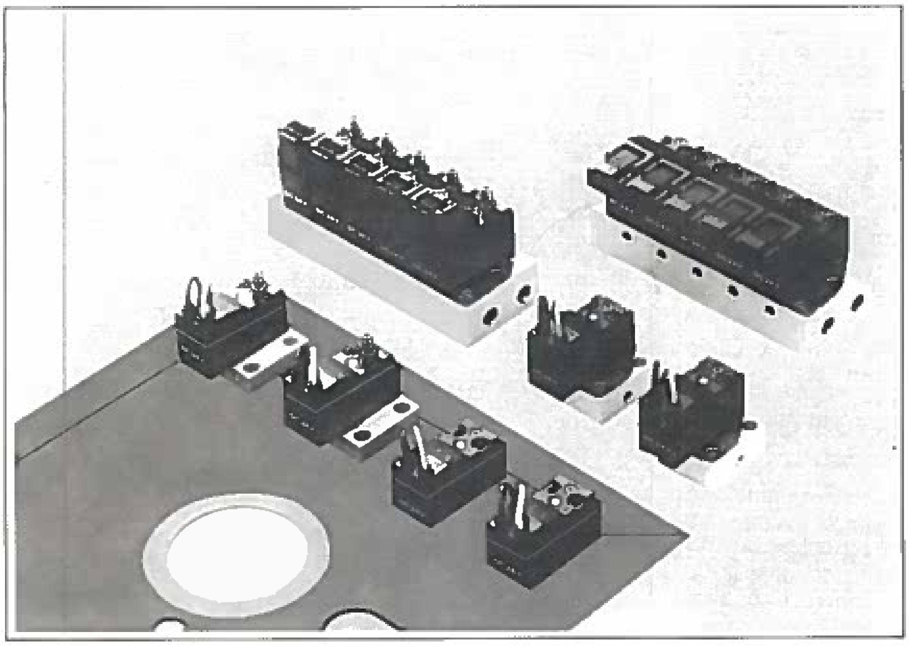
SOLENOID and AIR ACTUATED DIRECTIONAL CONTROL VALVES

Spool valves *(continued)*

		Series	Function	Port size	Cv	Flow to atmosphere	Page numbers
Spool valves ISO 1 interface		**VS16**	**5/2** **5/3**	**ISO 1 interface**	**0.70**	**19 dm³/sec**	**VS 16.1** **VS 16.2** **VS 16.3** **VS 16.4**
		**VS16** Single and gang manifolds (2 to 8 stations) for VS16 valves		**ISO 1 interface** **G1/8"** **G1/4"**			**VS 16.5** **VS 16.6**
Spool valves ISO 2 interface		**VS26**	**5/2** **5/3**	**ISO 2 interface**	**1.72** **1.40**	**50 dm³/sec** **38 dm³/sec**	**VS 26.1** **VS 26.2** **VS 26.3** **VS 26.4**
		**VS26** Single and gang manifolds (2 to 8 stations) for VS26 valves		**ISO 2 interface** **G1/4"** **G3/8"** **G1/2"**			**VS 26.5** **VS 26.6**

CKD picosol poppet valves
Series 3MAO and 3MBO

4mm barb tube fitting, M3
3/2



1. General description and application benefits

A range of high performance, miniature, direct acting, 3 port, 2 position poppet valves, subplate or manifold mounted. Low power solenoid operated.

- Miniature size - only 10mm wide.
- High flow.
- Lube free.
- Low power - 1W.
- Free standing or manifold mounted.
- Manual override as standard.
- Pre wired solenoid leads as standard.
- Surge killer as standard.
- Indicator lamp as standard.

2. Functional symbol

3. Model code

3 M * O 1 * - * * - * * - * *

[1] [2] [3] [4] [5]

[1] **Model**
A = Direct ported
B = Subplate or manifold ported

[2] **Mounting**
0 = Subplate
9 = Manifold

[3] **Port sizes**
00 = Base ported for manifold mounting (Series 3MBO19)
T4 = A port - 4mm barbed fitting P and R ports - M3 (Series 3MAO10 & 3MAO19)
M3 = A, P and R ports - M3 (Series 3MBO10)

[4] **Electrical connection**
C2 = C type plug in connector with surge killer and lamp. 300mm long lead wire

[5] **Voltage code**
KZ = 24v DC (standard)
JZ = 12v DC (option)
DC6V = 6v DC (option)
DC5V = 5v DC (option)

Preferred model selection

3MAO10 - T4 - C2 - **	3 port, 2 position,solenoid operated, spring return, subplate mounted, direct ported (A port)
3MBO10 - M3 - C2 - **	3 port, 2 position, solenoid operated, spring return, subplate mounted, subplate ported
3MAO19 - T4 - C2 - **	3 port, 2 position, solenoid operated, spring return, valve only for manifold mounting, direct ported (A port)
3MBO19 - 00 - C2 - **	3 port, 2 position, solenoid operated, spring return, valve only for manifold mounting

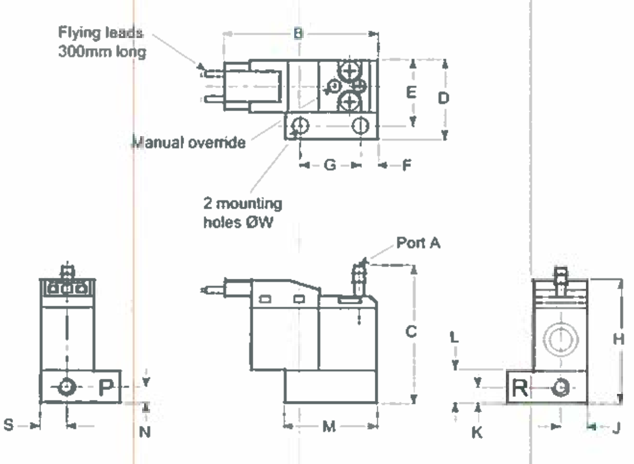
*** = Solenoid voltage code - to be specified (see position [5] above)*

4. Operating data

Flow factors to ISO 6358 (BS 7294)	Kv = 0.07 Cv = 0.005
Flow to atmosphere	0.83 dm3/sec (1.77 scfm)
Operating pressure	0 to 7 bar (0 to 100psig)
Ambient operating temperature range	5°C to 50°C (41°F to 122°F)
Response times at 6.3bar (90psig)	10msec or less
Type of connection and port sizes	3MAO - 4mm barbed fitting (A port), M3 (P & R ports) 3MBO - M3 (A, P & R ports)
Materials of construction	Body - Polyphenylene sulfide Plunger and springs - Stainless steel Valve seat - Nitrile rubber O rings - Fluorine rubber Gasket - Nitrile rubber
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Installation dimensions	See below
Mass	3MAO19 - T4 -C2 -** 18g 3MBO19 - 00 - C2 - ** 18g 3MAO10 - T4 - C2 - ** 24g 3MBO10 - M3 - C2 - ** 24g
Manifolds	For details see pages P3 2.1 - 2
Solenoid coils	Class B moulded coil. Nominal voltages - See position [5] of model code (page P3 1.1) Voltage tolerance +10% to -10% Coil consumption at nominal voltage and 20°C (68°F) ambient - 1.0W Holding current - 0.0417A Surge protection and indicator lamp standard 300mm flying lead standard
Service kits	Replace unit

5. Installation dimensions in mm

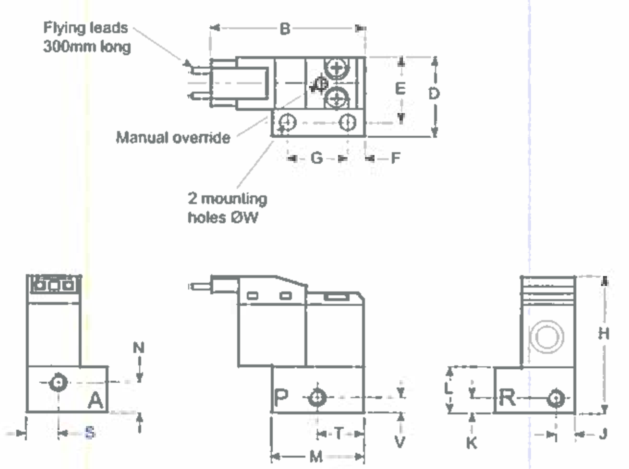
3MAO10 - T4 - C2 - **



Port A	Port P	Port R	B	C	D
4mm tube barb fitting	M3	M3	30	25.5	15.5

E	F	G	H	J	K	L	M	N	S	W
13	3	12	27	5	3	6	18	3	5	3.5

3MBO10 - M3 - C2 - **



Port A	Port P	Port R	B	D	E	F	G
M3	M3	M3	30	15.5	13	3	12

H	J	K	L	M	N	S	T	V	W
30	4	3	9	18	6	6	9	3	3.5

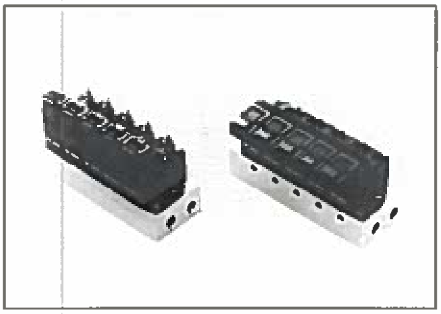
Note: All drawings on this page are reproduced to a scale of 70% (Copy at 141% to give full size)

VICKERS

Pneumatics

CKD picosol poppet valves
Series M3MAO and M3MBO manifolds

M3, M5, 4mm push in fitting
3/2



1. General description and application benefits

A range of manifolded valves of 2 to 20 stations with M5 common supply and exhaust connections using 3MAO19 or 3MBO19 series valves.

The 3MBO series manifolds are available with load ports M3, M5, or 4mm push in fitting.

Masking plates are available for blanking off any stations retained for future extension of the system.

- Compact unit for panel installations.
- Ease of fitting additional valves at a future date.
- Surge killer as standard.
- Common supply and exhaust.

2. Model code

M 3 M * O * 0 - * * - * * - [N] - * *

Positions: 1 (valve type), 2 (manifold type), 3 (port sizes), 4 (electrical connection), 5 (number of stations), 6 (voltage code)

1 Valve type
A = With series 3MAO19 valves
B = With series 3MBO19 valves

2 Manifold type
1 = Valves in all stations
8 = Mixed manifold

3 Port sizes
T4 = 4mm barbed fitting - A port (3MAO19 valves)
M3 = M3 - A port (3MBO19 valves)
M5 = M5 - A port (3MBO19 valves)
GS4 = 4mm push in fitting - A port (3MBO19 valves)

4 Electrical connection
C2 = C type plug in connector with surge killer and lamp. 300mm long lead wire

5 Number of stations
N = 2 to 20 for number of stations

6 Voltage code
KZ = 24v DC (standard)
JZ = 12v DC (option)
DC6V = 6v DC (option)
DC5V = 5v DC (option)

Preferred model selection

Model	Description
M3MAO10 - T4 - C2 - [N] - **	Manifold with 3MAO19 series valves (P and R ports - M5, A ports - 4mm tube barb fitting)
M3MBO10 - M3 - C2 - [N] - **	Manifold with 3MBO19 series valves (P and R ports - M5, A ports - M3)
M3MBO10 - M5 - C2 - [N] - **	Manifold with 3MBO19 series valves (P and R ports - M5, A ports - M5)
M3MBO10 - GS4 - C2 - [N] - **	Manifold with 3MBO19 series valves (P and R ports - M5, A ports - 4mm push in)
M3MAO10 - MP	Masking plate

*** = Solenoid voltage code - to be specified (see position 6 above)*

[N] = Number of stations (2 - 20)
i.e. 10 station manifold for use with 3MAO19 series valves at every station should be ordered as **M3MAO10 - T4 - C2 - 10 - ****

Mixed manifolds

When a mixed combination manifold (valves and masking plates) is required specify **8** in position 2 of the model code of the manifold to suit the valve type being used (Series 3MAO19 or Series 3MBO19) and station details (as shown below) to the end of the code.

M 3 M * O 8 0 - * * - C2 - [N] - * * - [S1] [MP]

[S1] = Number of 2 position single solenoid valves

Note : If 10 or more valves are required use code letters not numbers :- A = 10, B = 11, C = 12, D = 13, E = 14, F = 15, G = 16, H = 17, I = 18, J = 19, K = 20

[MP] = Number of masking plates

Note: If masking plates are not required for unused stations specify 0 in this position.

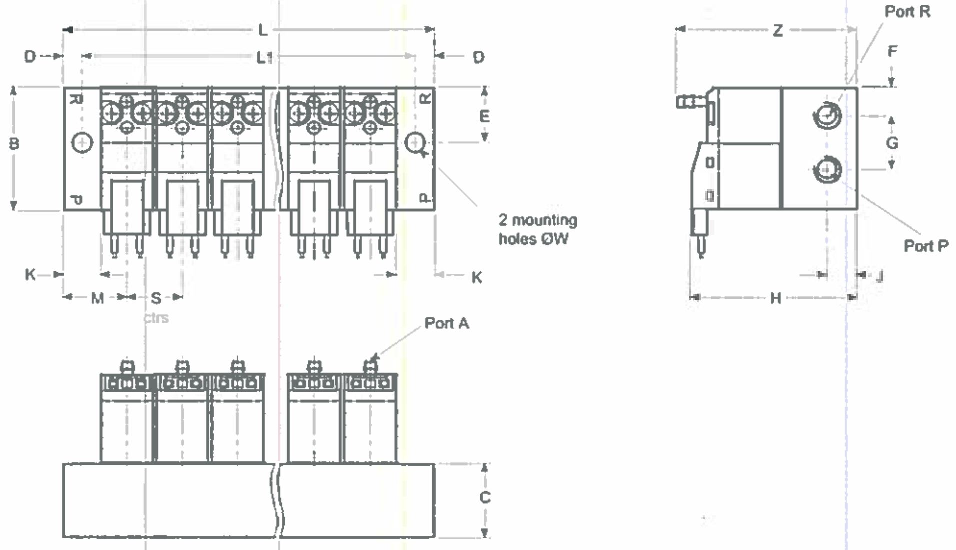
Example

A 7 station combination manifold with M3 ports having 5 off 3MBO19 valves with 24v DC single solenoids and 2 off masking plates would be ordered as

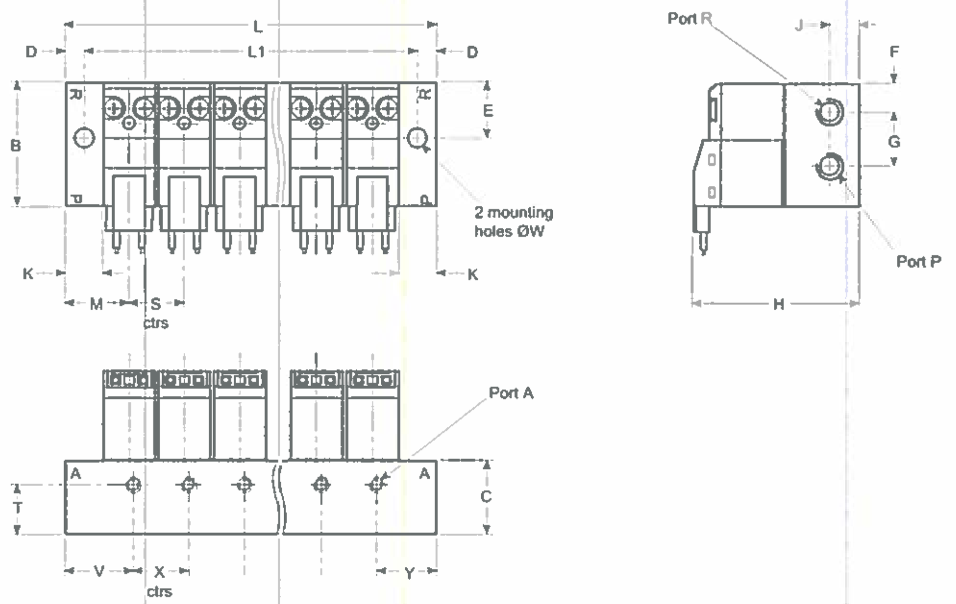
M3MBO80-M3-C2-7-KZ-52

3. Installation dimensions in mm

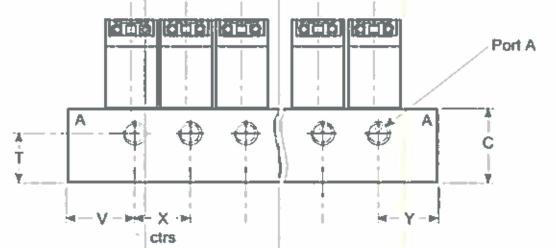
M3MBO10 - M3 - C2 - [N] - **



M3MBO10 - M3 - C2 - [N] - **



M3MBO10 - M5 - C2 - [N] - **



Note: All drawings on this page are reproduced to a scale of 70% (Copy at 141% to give full size)

Model Number	Port A	Port P	Port R	B	C	D	E	F	G	H
M3MAO10 - M3 - C2 - [N] - **	4mm tube barb fitting	2xM5	2xM5	24	14	3.5	10.5	5.2	10.5	35
M3MBO10 - M3 - C2 - [N] - **	NxM3	2xM5	2xM5	24	14	3.5	10.5	5.2	10.5	35
M3MBO10 - M5 - C2 - [N] - **	NxM5	2xM5	2xM5	24	14	3.5	10.5	5.2	10.5	35

N = Number of stations

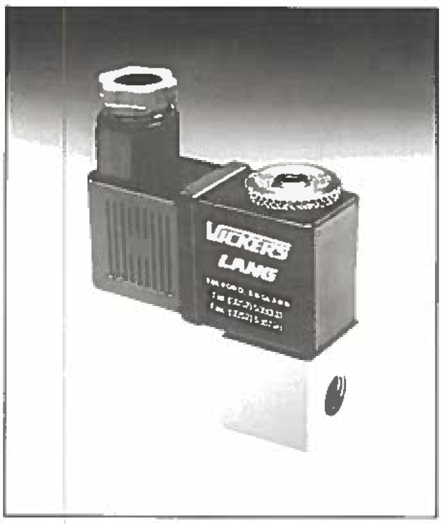
J	K	L	L1	M	S	T	V	W	X	Y	Z
5.5	7	Nx10.5+13.5	Nx10.5+6.5	12	10.5			3.5			33.5
5.5	7	Nx10.5+13.5	Nx10.5+6.5	12	10.5	9.5	13	3.5	10.5	11	
5.5	7	Nx10.5+13.5	Nx10.5+6.5	12	10.5	8.5	13	3.5	10.5	11	

Note: M3MBO10 - GS4 - C2 - [N] - ** will be supplied as M3MBO10 - M5 - C2 - [N] - ** plus N x push in fitting GMS4-M5-S for screwing into A ports.

VICKERS **Pneumatics**

Solenoid pilot/poppet valves
Series VEM 13D

1/8" BSP
3/2

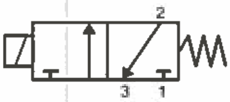


1. General description and application benefits

Free standing 3 way solenoid operated pilot valve, normally closed.

- Compact
- Simple reliable design
- Corrosion resistant

2. Functional symbol



3. Model code

V E M 1 3 D * *

** = Solenoid voltage code – to be specified at time of ordering in accordance with codes shown below.

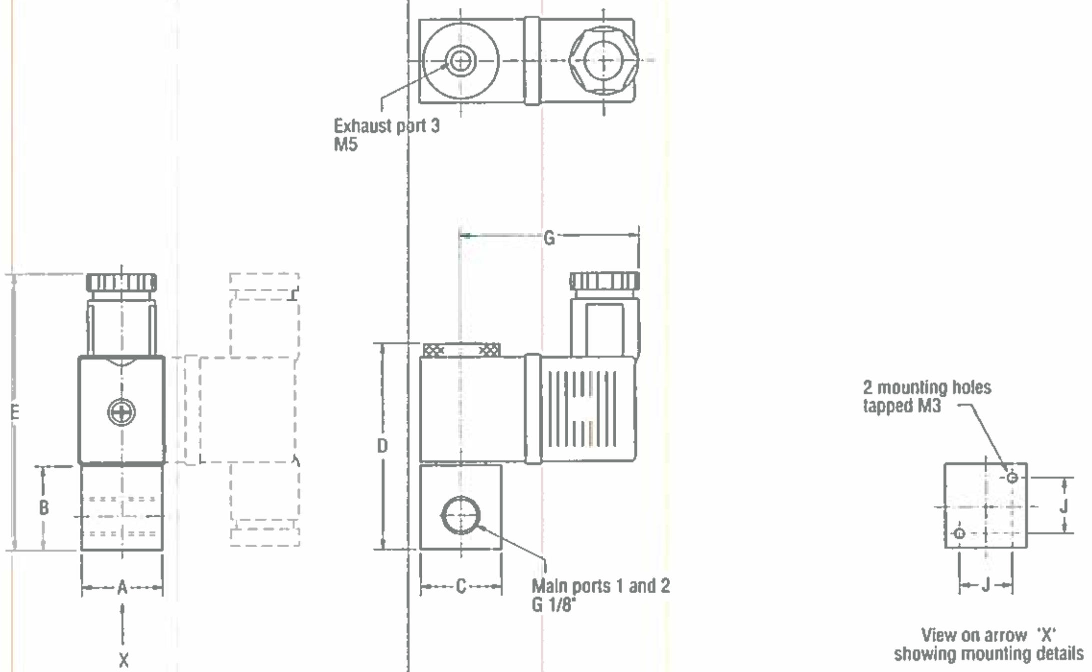
JZ = 12v DC
KZ = 24v DC
MZ = 48v DC

KY = 24v 50/60Hz AC
MY = 48v 50/60Hz AC
RY = 110/120v 50/60Hz AC
SY = 220/240v 50/60Hz AC

4. Operating Data

Flow to atmosphere at 6.3bar (90psig) body pressure	1.0 dm³/sec (2.12 scfm)
Orifice size	1.2mm diameter
Maximum operating pressure	10 bar (145 psig) Normally closed
Ambient operating temperature	-20°C to +50°C (-5°F to 123°F)
Type of connection	Screwthread
Port sizes	Ports 1 and 2 – G1/8", Port 3 – M5
Materials of construction	Body – Brass Internal parts – Stainless steel Seals – NBR
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG37 mineral oil.
Installation dimensions	See page VEM 1.2
Mass	VEM 13D** 0.162 kg (0.36 lb)
Solenoid coils	Fully encapsulated and tropicalised Class F insulation 155°C (310°F). Protection class I.P.65 when fitted with three pin socket connection to DIN 43650 Type B. Ambient temperature -10°C to +50°C (15°F to 123°F) Normal voltages – See details under model code above Voltage tolerance +10% to -10% Coil consumption at nominal voltage and 20°C (68°F) ambient. DC coils – 5W maximum AC coils – 5VA holding 8VA nominal inrush Lower power coils available on request
Service kits	Valve – VEM 13D/SA Solenoid coil – VEM 13-141**

5. Installation dimensions in mm (inches)



Model code	A	B	C	D	E	G	J
VEM 13D**	22 (0.87)	22 (0.87)	22 (0.87)	57.5 (2.26)	70 (2.76)	49 (1.93)	14 (0.55)

6. Ordering procedure

Order in accordance with model code shown on page VEM 1.1

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

Printed in Great Britain

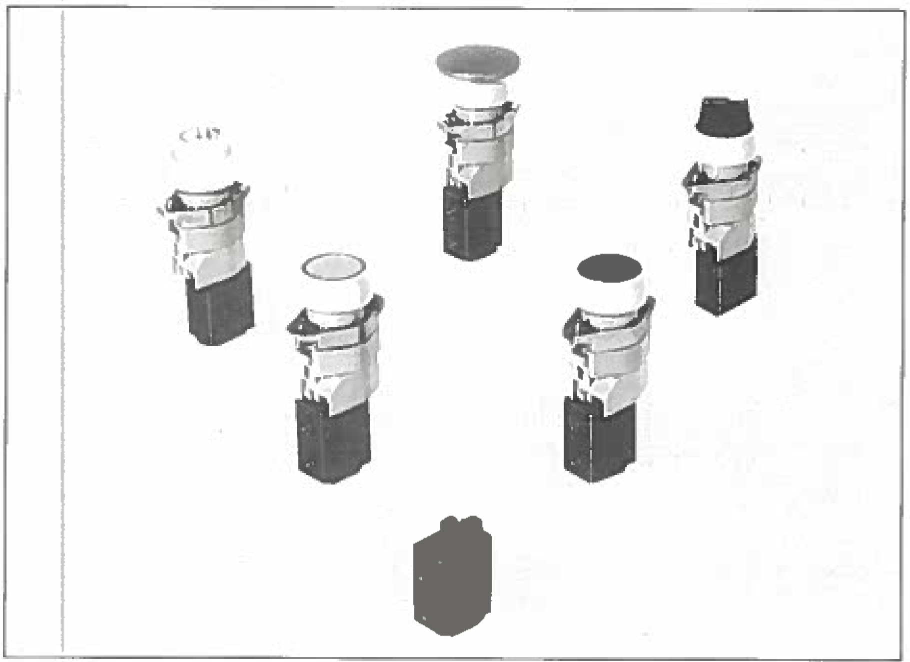
GB-P5013-VEM-0195

VICKERS

Pneumatics

Miniature poppet valves Series VPM005 and VPM013

M5 and 1/8" BSP
3/2



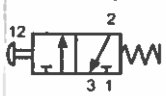
1. General description and application benefits

Miniature 3 way 2 position poppet valves, manually or mechanically operated.
Suitable for use with dry or lubricated air.

- Compact and lightweight.
- Large flows.
- Lube free.
- Electrical style actuators.
- Closed centre position.
- Pilot operate larger directional valves.
- Operate single acting cylinders direct.
- Rapid assembly of valve/operator.

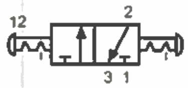
2. Functional symbols

VPM005/1, VPM013/1, VPM005/10*, VPM013/10*



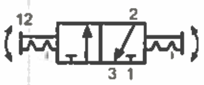
3 port, 2 position
Normally closed
Pushbutton/plunger operated
Spring return

VPM005/8*, VPM013/8*



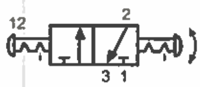
3 port, 2 position
Normally closed
Two position maintained pushbutton operated

VPM005/9, VPM013/9



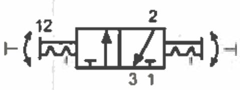
3 port, 2 position
Normally closed
Two position maintained rotary switch operated

VPM005/12, VPM013/12



3 port, 2 position
Normally closed
Mushroom pushbutton operated
Twist reset

VPM005/14, VPM013/14



3 port, 2 position
Normally closed
Two position maintained key switch operated

3. Model code

V P M * * * / * * *

1 (under * * *), 2 (under * *), 3 (under *)

[1] Port sizes
005 = M5
013 = G1/8"

[2] Operator style
1 = Pushbutton/ plunger.
8 = Maintained pushbutton.
9 = Two position maintained rotary switch.
10 = Momentary pushbutton.
12 = Mushroom pushbutton. Twist reset.
14 = Two position maintained key switch.

Note: Style 1 is the basic valve.
Styles 8, 9, 10, 12 and 14 are electrical style operators

[3] Operator colour
(for style 8 and 10 operators)
A = Amber.
B = Blue.
G = Green.
R = Red.

NOTE:
Style 12 operator is available in RED only and is recommended for emergency stop apllications.

For preferred model selection see page VPM 1.2

Preferred model selection

M5 product range

VPM005/1	M5, 3 port, 2 position, normally closed, pushbutton/plunger operated.
VPM005/8A	M5, 3 port, 2 position, normally closed, maintained pushbutton operated - Amber.
VPM005/8B	M5, 3 port, 2 position, normally closed, maintained pushbutton operated - Blue.
VPM005/8G	M5, 3 port, 2 position, normally closed, maintained pushbutton operated - Green.
VPM005/8R	M5, 3 port, 2 position, normally closed, maintained pushbutton operated - Red.
VPM005/9	M5, 3 port, 2 position, normally closed, two position maintained rotary switch operated.
VPM005/10A	M5, 3 port, 2 position, normally closed, momentary pushbutton operated - Amber.
VPM005/10B	M5, 3 port, 2 position, normally closed, momentary pushbutton operated - Blue.
VPM005/10G	M5, 3 port, 2 position, normally closed, momentary pushbutton operated - Green.
VPM005/10R	M5, 3 port, 2 position, normally closed, momentary pushbutton operated - Red.
VPM005/12	M5, 3 port, 2 position, normally closed, mushroom pushbutton operated - Red, twist reset.
VPM005/14	M5, 3 port, 2 position, normally closed, two position maintained key switch operated.

G1/8" product range

VPM013/1	G1/8", 3 port, 2 position, normally closed, pushbutton/plunger operated.
VPM013/8A	G1/8", 3 port, 2 position, normally closed, maintained pushbutton operated - Amber.
VPM013/8B	G1/8", 3 port, 2 position, normally closed, maintained pushbutton operated - Blue.
VPM013/8G	G1/8", 3 port, 2 position, normally closed, maintained pushbutton operated - Green.
VPM013/8R	G1/8", 3 port, 2 position, normally closed, maintained pushbutton operated - Red.
VPM013/9	G1/8", 3 port, 2 position, normally closed, two position maintained rotary switch operated.
VPM013/10A	G1/8", 3 port, 2 position, normally closed, momentary pushbutton operated - Amber.
VPM013/10B	G1/8", 3 port, 2 position, normally closed, momentary pushbutton operated - Blue.
VPM013/10G	G1/8", 3 port, 2 position, normally closed, momentary pushbutton operated - Green.
VPM013/10R	G1/8", 3 port, 2 position, normally closed, momentary pushbutton operated - Red.
VPM013/12	G1/8", 3 port, 2 position, normally closed, mushroom pushbutton operated - Red, twist reset.
VPM013/14	G1/8", 3 port, 2 position, normally closed, two position maintained key switch operated.

4. Operating data

Flow factors to ISO 6358 (BS 7294)	Conductance C = 0.65 dm^3/sec/bar Critical pressure ratio b = 0.21 Kv = 2.5 Cv = 0.175
Flow to atmosphere at 6.3 bar (90 psig) body pressure	4.8 dm3/sec (10.2 scfm)
Operating pressure	0.5 to 10 bar (7.2 to 145 psig)
Ambient operating temperature range	VPM005/1, VPM013/1, -20^{0}C to + 75^{0}C (-5^{0}F to 167^{0}F) All other types, -20^{0}C to + 50^{0}C (-5^{0}F to 123^{0}F)
Type of connection and port sizes	Ports 1 & 2 - Screwthread - M5 (VPM005 series), G1/8" (VPM013 series) Port 3 - Stem exhaust
Materials of construction	Body - Anodised aluminium alloy Poppet - Acetal Spindles - PTFE coated stainless steel Seals - Nitrile
Operating medium	Compressed air, filtered and lubricated or non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Electrical style actuators	For details of assembly to valve body sub-assembly having actuator snap adaptor see page VPM 1.3
Installation dimensions	Basic valve -see page VPM 1.3 Valves with electrical style actuators - see page VPM 1.4
Mass	VPM005/1 - 0.037kg VPM013/1 - 0.035kg VPM005/8* - 0.083kg VPM013/8* - 0.081kg VPM005/9 - 0.091kg VPM013/9 - 0.089kg VPM005/10* - 0.083kg VPM013/10* - 0.081kg VPM005/12 - 0.066kg VPM013/12 - 0.064kg VPM005/14 - 0.132kg VPM013/14 - 0.130kg
Service kits	Fit new units

5. Electrical style actuators

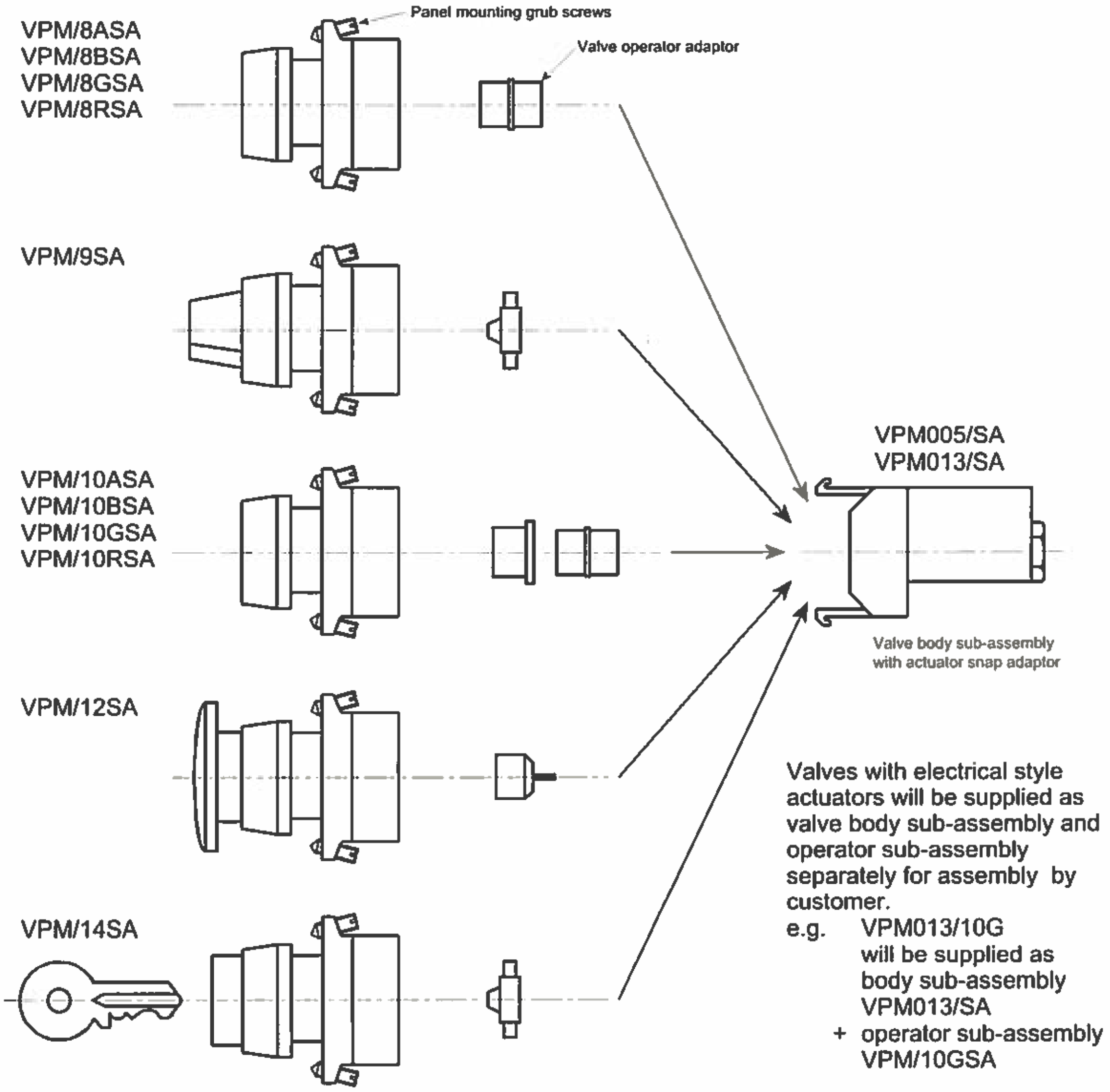
Maintained pushbutton VPM/8ASA, VPM/8BSA, VPM/8GSA, VPM/8RSA

Two position rotary swich VPM/9SA

Momentary pushbutton VPM/10ASA, VPM/10BSA, VPM/10GSA, VPM/10RSA

Mushroom pushbutton VPM/12SA

Two position key switch VPM/14SA

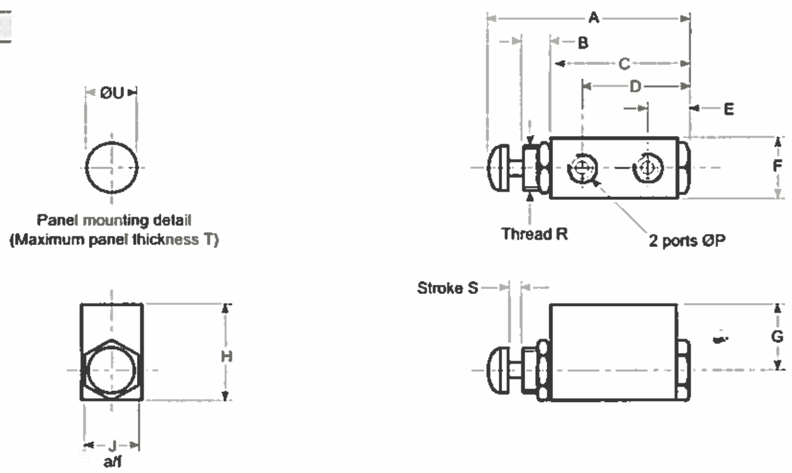


Valves with electrical style actuators will be supplied as valve body sub-assembly and operator sub-assembly separately for assembly by customer.

e.g. VPM013/10G will be supplied as body sub-assembly VPM013/SA + operator sub-assembly VPM/10GSA

6. Installation dimensions in mm - Basic pushbutton/plunger operated valve

VPM005/1, VPM013/1

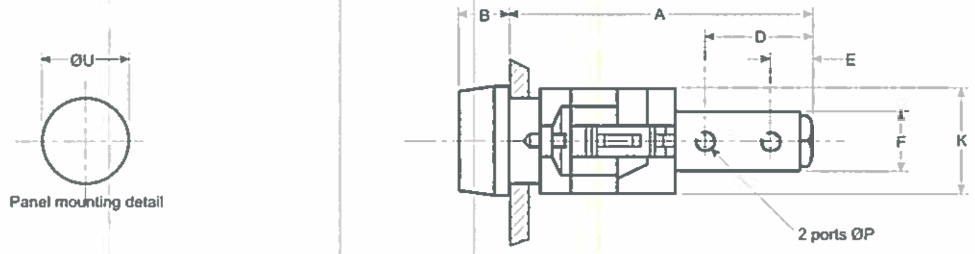


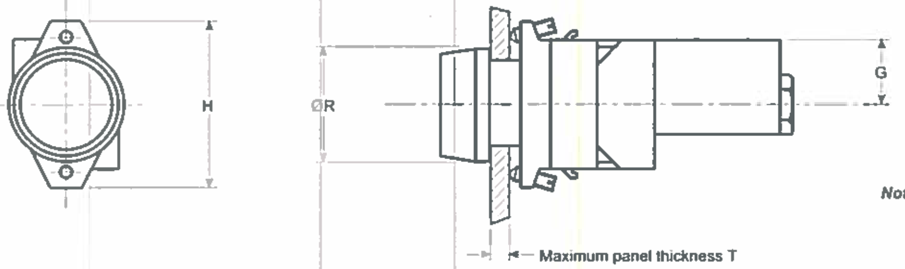
Model code	A	B	C	D	E	F	G	H	J	P	R	S	T	U
VPM005/1	50.5	5.7	35.7	27.7	10.6	16	16.6	25.4	15.2	M5	M12x1.0 - 6g	5	3.5	12.5
VPM013/1	50.5	5.7	35.7	27.7	10.6	16	16.6	25.4	15.2	G1/8"	M12x1.0 - 6g	5	3.5	12.5

Note: *All drawings on this page are reproduced to a scale of 50% (Copy twice at 141% to give full size)*

7. Installation dimensions in mm - Valves with electrical style actuators

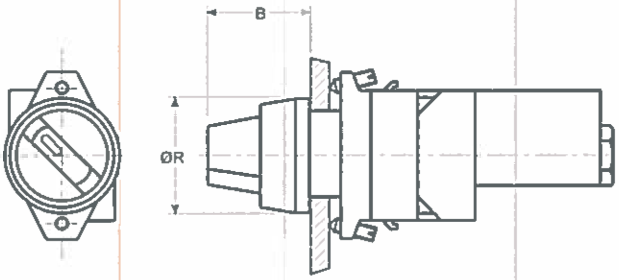
VPM005/8*, VPM013/8*





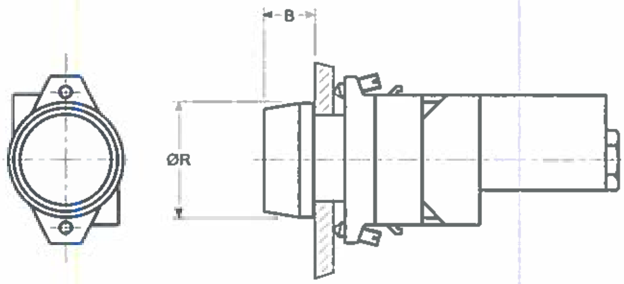
Note: All drawings on this page are reproduced to a scale of 50% (Copy twice at 141% to give full size)

VPM005/9, VPM013/9



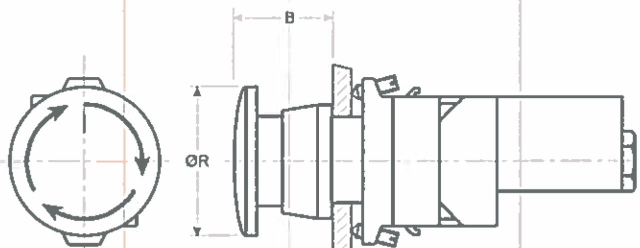
All other dimensions as for VPM005/8, VPM013/8* above*

VPM005/10*, VPM013/10*



All other dimensions as for VPM005/8, VPM013/8* above*

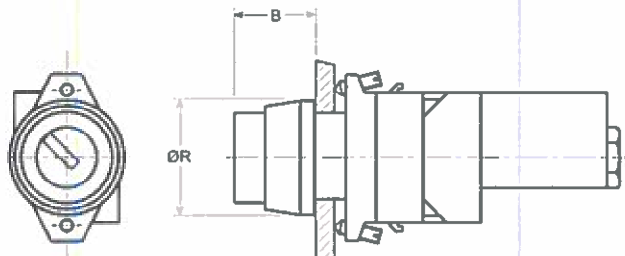
VPM005/12, VPM013/12



Note: Operating button colour - RED. Twist to reset.

All other dimensions as for VPM005/8, VPM013/8* above*

VPM005/14, VPM013/14



Note: Key removable in both positions

All other dimensions as for VPM005/8, VPM013/8* above*

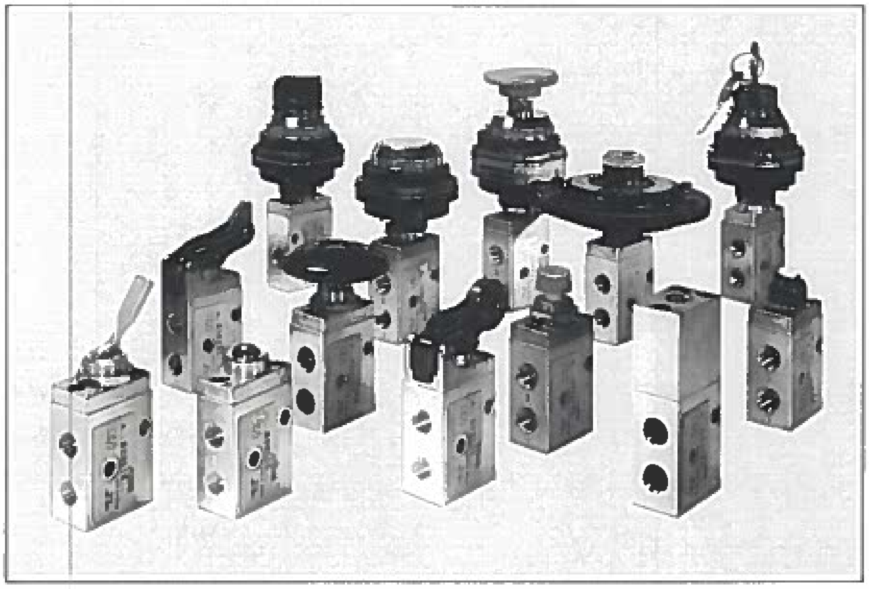
Model code	A	B	D	E	F	G	H	K	P	R	T	U
VPM005/8*	80	13	27.7	10.6	16	16.6	44	28	M5	29	8	22.5/22.7
VPM013/8*	80	13	27.7	10.6	16	16.6	44	28	G1/8"	29	8	22.5/22.7
VPM005/9	80	27	27.7	10.6	16	16.6	44	28	M5	29	8	22.5/22.7
VPM013/9	80	27	27.7	10.6	16	16.6	44	28	G1/8"	29	8	22.5/22.7
VPM005/10*	80	13	27.7	10.6	16	16.6	44	28	M5	29	8	22.5/22.7
VPM013/10*	80	13	27.7	10.6	16	16.6	44	28	G1/8"	29	8	22.5/22.7
VPM005/12	80	25	27.7	10.6	16	16.6	44	28	M5	40	8	22.5/22.7
VPM013/12	80	25	27.7	10.6	16	16.6	44	28	G1/8"	40	8	22.5/22.7
VPM005/14	80	21	27.7	10.6	16	16.6	44	28	M5	29	8	22.5/22.7
VPM013/14	80	21	27.7	10.6	16	16.6	44	28	G1/8"	29	8	22.5/22.7

* - For complete model number add letter corresponding to pushbutton colour:- A = Amber, B = Blue, G = Green, R = Red

Pneumatics

Miniature pilot / poppet valves Series VP

1/8"BSP
3/2



Description
Miniature 3-way pilot valve, with spring return. Suitable for Normally-Closed or Normally-Open applications.

Type of Connection
Screwthread.

Port Sizes
G⅛".

Operating Pressure
0.3 to 7 bar (normally-open).
0.3 to 10 bar (normally-closed).

Operating Temperature
-10°C to 75°C.

Flow to Atmosphere (At 6.3 bar, body pressure)
7.7 dm^3/s.

Type of Lubricant
Oil-Shell Tellus 37 or equivalent.

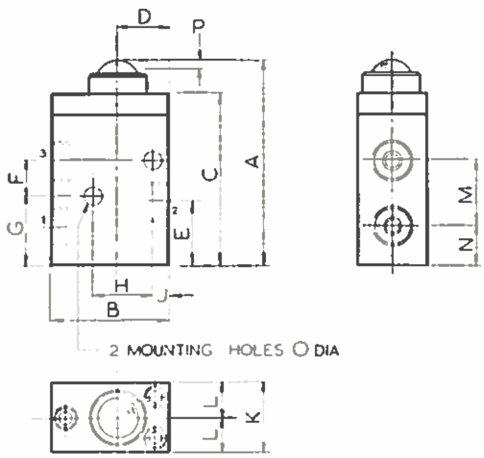
Stroke
Nominal stroke of valve spindle 3.2mm. Approximately 0.7mm of additional overtravel is provided.

KV Flow Factor
3.1.

Materials of Construction
All brass body, stainless steel spindle, nitrile seals and poppet, stainless steel springs, steel levers and diaphragm housing.

Special Remarks
Fifteen methods of actuation are available and most are suitable for bank or panel mounting,depending on choice of operator. Valves have a sealed mid-position during transition. Normally closed version have reduced operating efforts for easier manual operations.

Principal Dimensions:



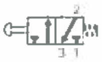
PORTING DETAILS — All Types - G1/8"

Type	Port 1	Port 2	Port 3
Normally Closed	Inlet	Outlet	Exhaust
Normally Open	Exhaust	Outlet	Inlet

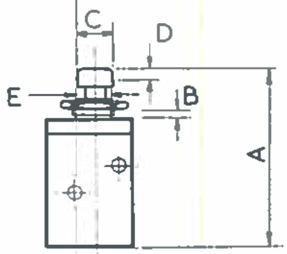
Port numbers are marked on body.

	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P
mm	56.3	31.8	47	14.5	17.5	9.5	19	16.6	4.3	19	9.5	17.5	11	5 mm Clearance	Stroke 3.2

VP13C/INC



PUSH BUTTON OPERATED



A	B	C	D	E*
66	4.7	13.5	3.2	16 mm Clearance Hole

*Required for panel mounting.

Green button supplied as standard.

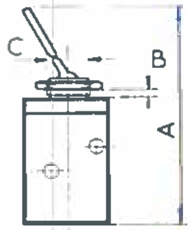
Includes screwed neck and lock nut for panel mounting.

Operating effort at 6.3 bar,:

VP 13C/1NC	Push Button — Spring return N/C	—	20.5N

VP13C/3

SWITCH OPERATED



A	B	C*
80.9	4.7	16 mm Clearance Hole

*Required for panel mounting.

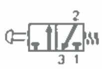
Includes screwed neck and lock nut for panel mounting, allowing switchboard-type control. 2 position positive.

Operating effort at 6.3 bar,

VP 13C/3	Switch — Positive	—	0.27NM

G (Green Button) R (Red Button)

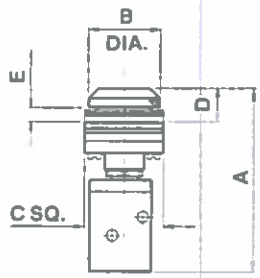
VP13C/10 GNC
VP13C/10RNC



FULL GUARD PUSH BUTTON OPERATED

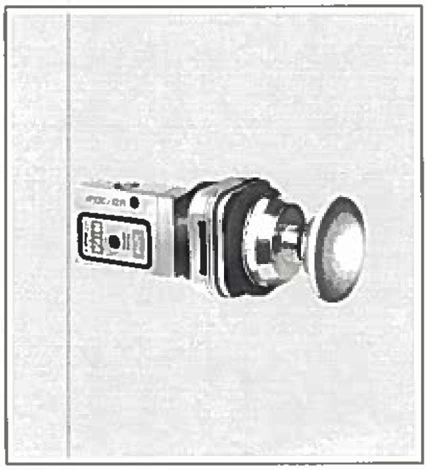
A	B	C	D	E max
93.7	34.5	40.5	17.5	6

For panel mounting details, see page 3.2.11.



Operating effort at 6.3 bar,

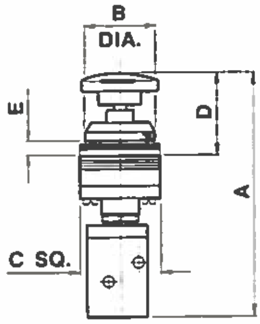
VP 13C/10GNC	Push Button (Full Guard) — Spring return N/C —	20.5N
VP 13C/10RNC	Push Button (Full Guard) — Spring return N/C —	20.5N



VP13C/12G
VP13C/12R

MUSHROOM BUTTON OPERATED 'Stay-put'

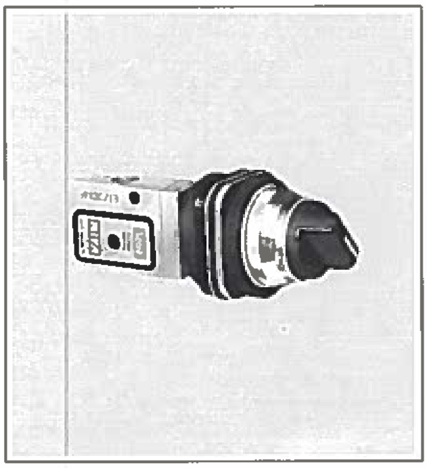
A	B	C	D	E max
125.4	34.5	40.5	44.5	6



For panel mounting details, see page 3.2.11.

Operating effort at 6.3 bar.

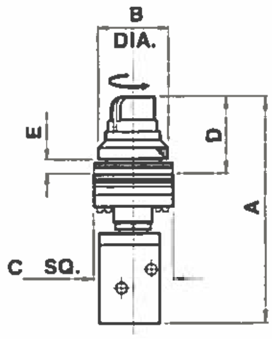
VP 13C/12G	Mushroom Button ('Stay put') — Positive —	37.8N
VP 13C/12R	Mushroom Button ('Stay put') — Positive —	37.8N



VP13C/13

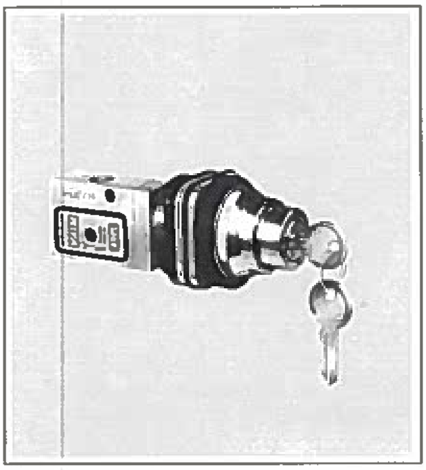
SEMI-ROTARY SELECTOR SWITCH OPERATED

A	B	C	D	E max
115.9	34.5	40.5	39.0	6



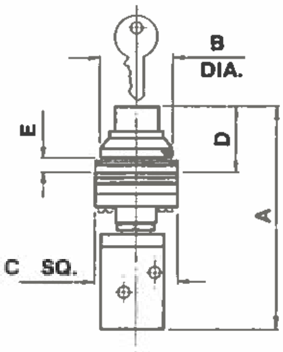
For panel mounting details, see page 3.2.11.

VP 13C/13	Switch — 2 position positive



VP13C/14

KEY OPERATED



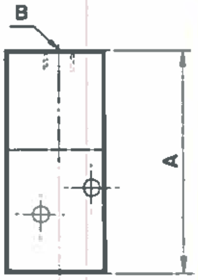
A	B	C	D	E max.
112.7	34.5	40.5	33.0	6

For panel mounting details, see page 3.2.11.

VP 13C/14	Key — 2 position positive With key removable in unoperated position.

VP13C/19

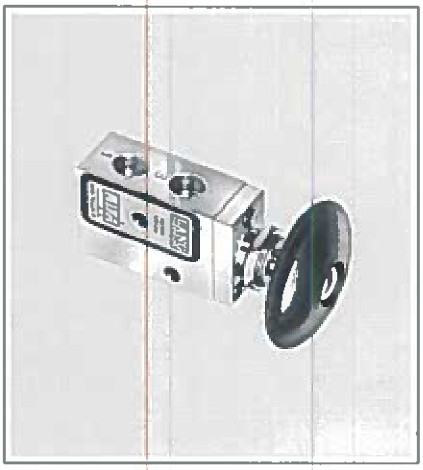
AIR OPERATED



A	B
73	G⅛"

Operating pressure at 6.3 bar,

VP 13C/19	Air — Spring return —	2 bar

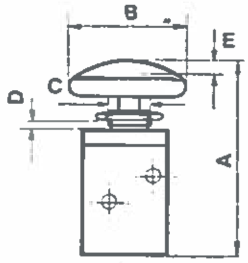


VP13C/23NC

PALM OPERATED

A	B	C*	D	E
73	44	16 mm Clearance Hole	4.7	Stroke 3.2

*Required for panel mounting.



Black button supplied as standard — green button (VP13C/GNC) or red button (VP13C/RNC) available to special order.

Fitted with a moulded plastic hand pad, this valve can be used for manual initiation of automatic sequences, and for many other hand operated pilot valve duties. This valve is not suitable for bank mounting. Includes screwed neck and lock nut for panel mounting.

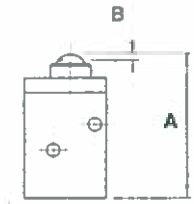
Operating effort at 6.3 bar.

VP 13C/23NC	Palm — Spring return N/C —	20.5N

VP13C/24

BALL OPERATED

A	B
56.3	Stroke 3.2



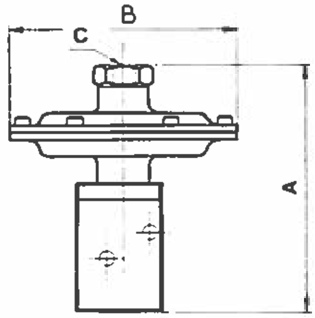
This method of operation is suitable for any duty where the valve is directly operated mechanically.

Operating effort at 6.3 bar,

VP 13C/24	Ball — Spring return —	37.8N

VP13C/25

DIAPHRAGM OPERATED



A	B	C
90	82.5	G⅛"

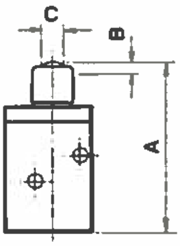
For applications where only a low signal pressure is available to operate the valve. The principle on which these valves operate is that the large diaphragm area acted upon by a low signal pressure provides sufficient effort to operate the valve.

Operating pressure at 6.3 bar,

VP 13C/25	Diaphragm — Spring return —	0.24 bar

VP13C/36

PLUNGER OPERATED (GAITERED)



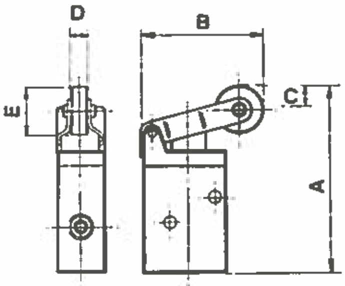
A	B	C
63	Stroke 3.2	8

Operating effort at 6.3 bar,

VP 13C/36	Plunger (Gaitered) — Spring return —	37.8N

VP13C/RT

ROLLER OPERATED



A	B	C	D	E
74	47.6	7.9	6.3	19 dia.

Suitable for applications where cam operation is required.

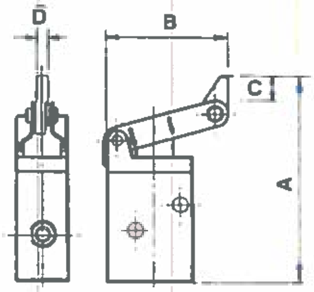
Stainless Steel Roller.

Operating effort at 6.3 bar,

VP 13C/RT	Roller — Spring return —	17.8N

VP13C/T

TRIP OPERATED



A	B	C	D
77.7	43.6	7.9	4.7

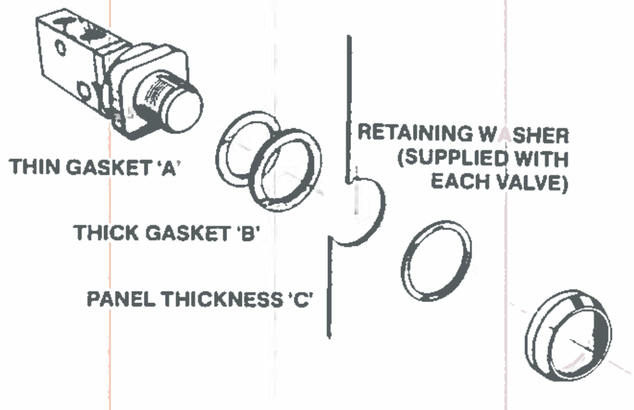
Suitable for applications where one way trip is required, allowing free passage of an operating cam on the opposite stroke without operation of the valve.

Stainless steel trip.

Operating effort at 6.3 bar.

VP 13C/T	Trip — Spring return —	17.8N

PANEL MOUNTING DETAILS



Fixing: The units are secured from the front by means of a fixing ring. A set of gaskets ensure a waterproof fit. The table shows the number of gaskets to use for a given panel thickness. Individual gaskets are not available.

C Panel Thickness	A = 1.0 mm		B = 3.0 mm
1.5 mm	3 x A	+	1XB
2.0 mm	2 x A	+	1XB
3.0 mm	1 x A	+	1XB
4.0 mm			1XB
5.0 mm	2 x A		
6.0 mm	1 x A		

PANEL CUTOUT

STAGE 1 & 2 IN MAKING PANEL CUT OUT

For VP 13C/10G; 12R; 13; 14.

F	G	H
30.5	5.0	15.0

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

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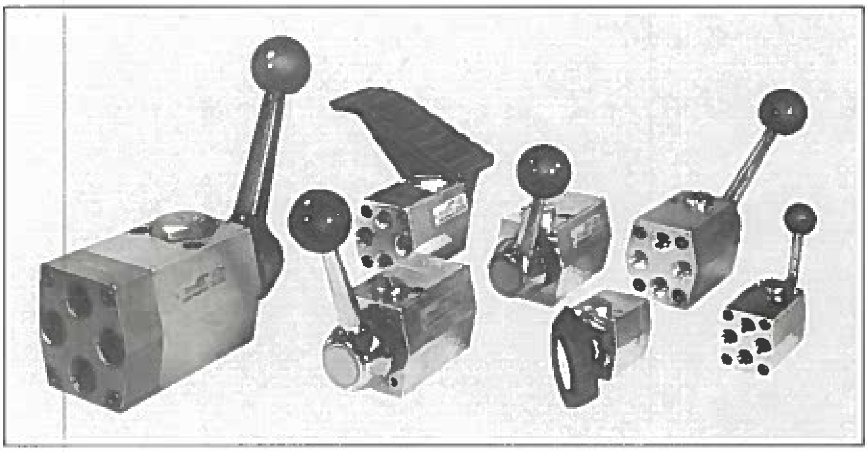
Semi-rotary slide valves
Series VRP13 and VR25

1/8" and 1/4" BSP-4/2 and 4/3
32, 40, 50, 63, 80, 100mm



Description
4-way Semi-Rotary Slide Valve, available lever, foot or switch operated.

Type of Connection
Screwthread, all ports in one face.

Port Sizes
VRP13-⅛" B.S.P.
VR 25 -¼" B.S.P.

Operating Pressure
0.5 to 10 bar.

Operating Temperature
-20˚C to +80˚C

Flow to Atmoshere
(At 6.3 bar, body pressure)
VRP 13-6dm^3/s;
VR 25-17 dm^3/s;

Actuating Torque
VRP 13-Positive, 0.68 Nm;
Self-Centring, 1.15 Nm;
Spring Ret., 1.36 Nm;
VR 25-Positive, 1.08 Nm;
Self-Centring, 2.44 Nm;
Spring Ret., 3.25 Nm;

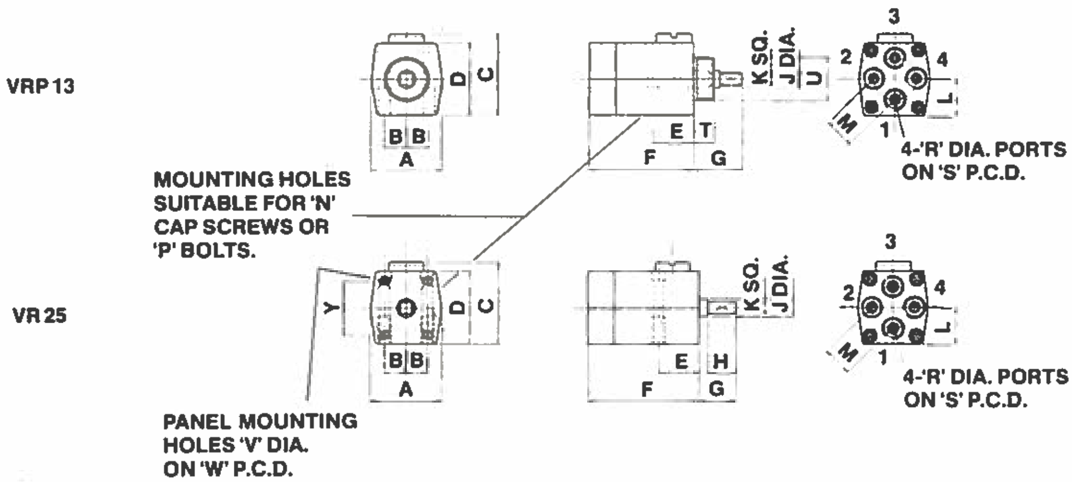
Panel Mounting
Both types are suitable for panel or body mounting (See under individual types).

Type of Lubricant
Oil-Shell Tellus 37 or Equivalent.

Materials of Construction
Brass Body and Port Block, Carbon-filled P.T.F.E. Slide, Steel Spindle.
See additional notes on Pages VR25.4

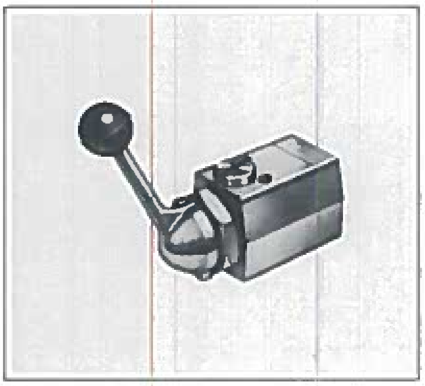
KV Flow Factors
VRP 13-2.7.
VR 25-5.5.

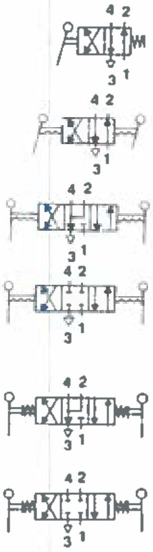
Principal Dimensions



	A	B	C	D	E	F	G	J	K	L	M	N	P	R	S	T	U
VRP 13	31.7	9.5	37.3	33.3	15.1	48.4	19.8	7.9	5.5	16.6	13.5	M4	M5	G⅛	19.0	9.5	M20 x 1.5

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	V	W	Y
VR 25	47.6	12.7	54.7	50.8	23.8	69.0	22.2	14.2	12.7	9.5	25.4	21.4	M5	M6	G¼	30.1	M5	44.4	35





VRP 13/3
2 pos. Spring return

VRP 13/3L
2 pos. positive

VRP 13/3UL
3 pos. positive.
Press. rel. neutral

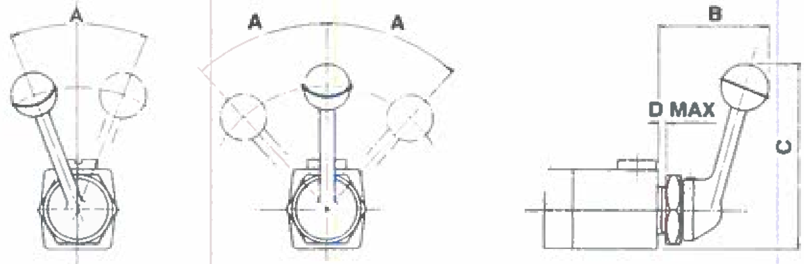
VRP 13/3PL
3 pos. positive.
Press held neutral

VRP 13/3U
3 pos. self-cent.
Press. rel. neutral

VRP 13/3P
3 pos. self-cent.
Press. held neutral

Principal Dimensions:

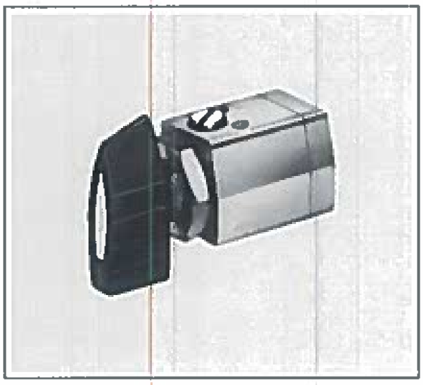
LEVER OPERATED — PANEL MOUNTED

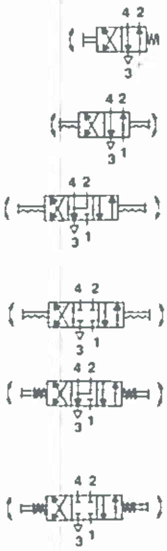


A	B	C	D
42°	45	77	3

PANEL DRILLING

H
20.6





VRP 13/4
2 pos. Spring return

VRP 13/4L
2 pos. positive

VRP 13/4UL
3 pos. positive.
Press. rel. neutral

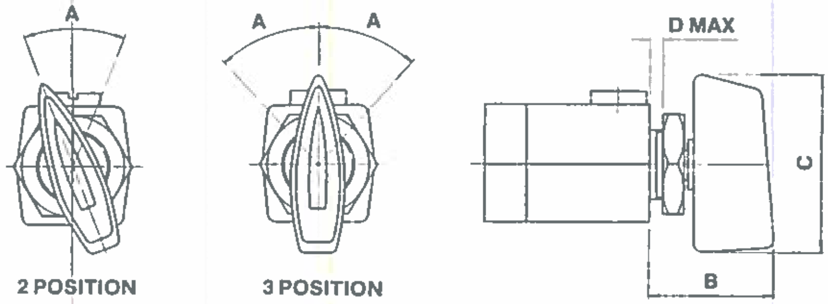
VRP 13/4PL
3 pos. positive.
Press held neutral

VRP 13/4U
3 pos. self-cent.
Press. rel. neutral

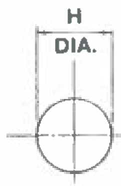
VRP 13/4P
3 pos. self-cent.
Press. held neutral

Principal Dimensions:

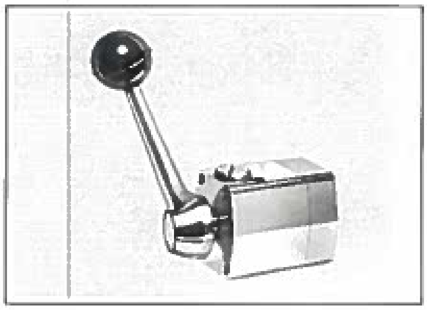
SWITCH OPERATED — PANEL MOUNTED



A	B	C	D
42°	45	51	3

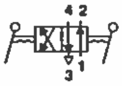


H
20.6



VR 25/3
2 pos. Spring return

VR 25/3L
2 pos. positive

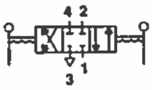


VR 25/3U
3 pos. self-cent.
Press. rel. neutral

VR 25/3P
3 pos. self-cent.
Press held neutral

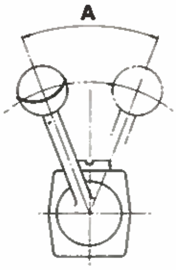
VR 25/3UL
3 pos. positive.
Press. rel. neutral

VR 25/3PL
3 pos. positive.
Press. held neutral

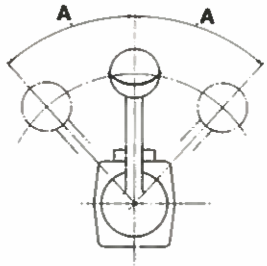


Principal Dimensions

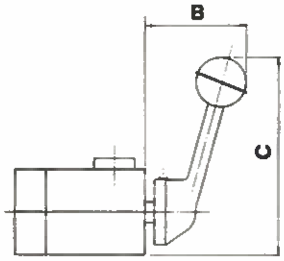
LEVER OPERATED



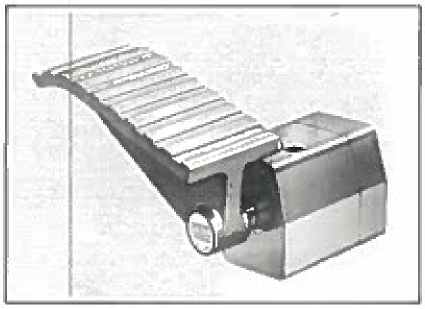
2 POSITION



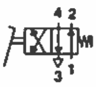
3 POSITION



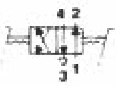
A	B	C
48°	60	128



VR 25/7
2 pos. Spring return



VR 25/7L
2 pos.positive

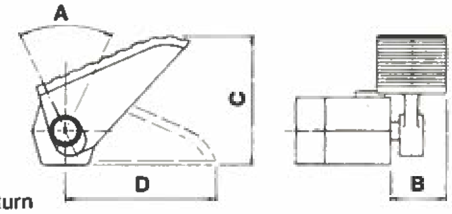


Principal Dimensions

FOOT OPERATED — 2 POSITION

2 POSITION — SPRING RETURN

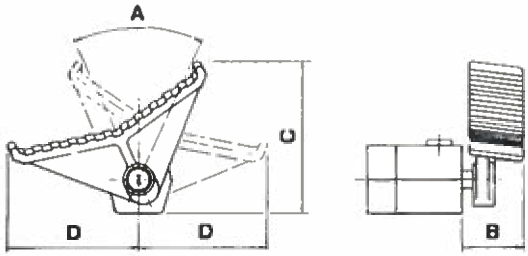
A	B	C	D
48	41	98	110

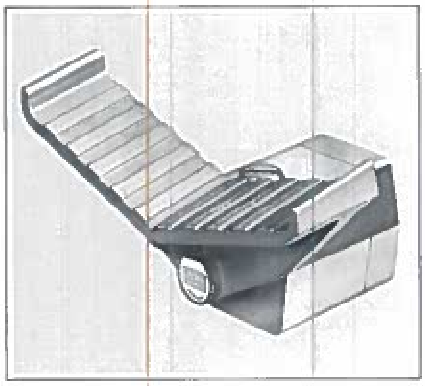


Special Remarks
The position of the 2 position spring return pedal can be reversed if required. Simply remove the pedal, unscrew the domed plunger on top of the valve body, turn the spindle through 180° and reassemble in alternative position.

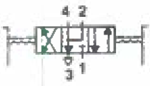
2 POSITION — POSITIVE

A	B	C	D
48°	45	111.9	97

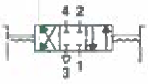




VR 25/7UL
3 pos. positive.
Press. rel. neutral



VR 25/7PL
3 pos. positive.
Press. held neutral

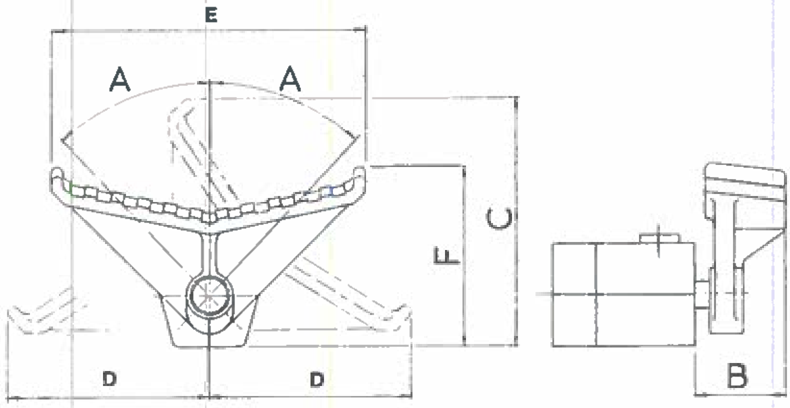


VR 25/7U
3 pos. self-cent.
Press rel. neutral

VR 25/7P
3 pos. self-cent.
Press held neutral

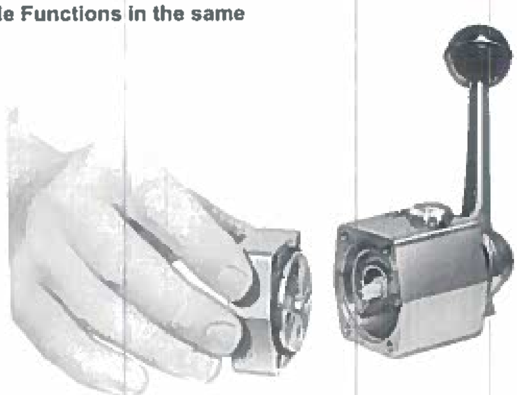
Principal Dimensions

FOOT OPERATED — 3 POSITION



A	B	C	D	E	F
48°	46	122.2	97	152.4	87.3

Interchangeable Functions in the same Valve



A unique feature of the VR range is that either the Pressure Held Neutral or Pressure Release Neutral functions are available within the same valve.

If the alternative function is required to the one supplied ex-Works this can be obtained, quite simply, by reversing the position of the port block.

This is a simple 3 stage operation:

1. Unscrew the 4 cap screws and remove port block from valve body
2. Turn the port block through 180°
3. Replace the port block.

Note: After reversing the port block, the supply line must still be connected to the same relative port position previously used on the valve. i.e. port No. 3 becomes the supply port, with port No. 1 as exhaust, or vice versa.

When altering used valves, as described above, it may be necessary to re-lap the brass port block.

Additional Notes

All of the switch, lever handle and foot pedal operators detailed on the preceeding pages can be removed and refitted at 90° intervals if so required.

2 position spring return versions are normally supplied for manual clockwise operation, that is, viewed from the spindle end.

The versions can be adopted for counter-clockwise operation, if required, by carefully removing the screwed plug on top of the valve body and rotating the exposed plunger through 180°

In the case of foot pedal versions, the pedal itself must also be reversed.

The basic valve is suitable for 3/2 operation with redundant outlet port plugged.

Semi-rotary slide valves Series VR50

1/2" BSP-4/2 and 4/3

100, 125, 160mm

Description
4-way Semi-Rotary Slide Valve, available lever operated only.

Type of Connection
Screwthread, all ports in one face.

Port Sizes
½: B.S.P.

Operating Pressure
0.5 to 10bar.

Operating Temperature
-20°C to +80°C.

Flow to Atmosphere (At 6.3 bar, body Pressure)
68 dm^3/s;

Actuating Torque
Positive, 4.62 Nm;
Self-Centring, 8.2 Nm;
Spring Ret., 9.75 Nm;

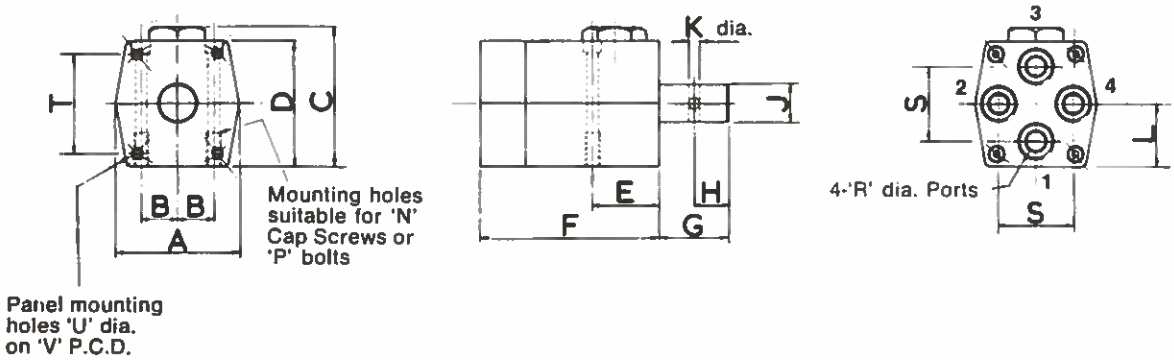
Panel Mountng
Valve body is furnished with four tapped holes in front face to facilitate panel mounting. Holes are also provided for body mounting. (See illustration below).

Type of Lubricant
Oil-Shell Tellus 37 or Equivalent.

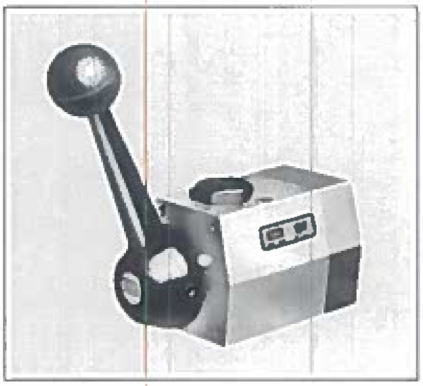
Materials of Construction
Hard-Anodised body and port block, Carbon-filled P.T.F.E. Slide, Stainless Steel Springs, Hardened and Ground Mild Steel Spindle and Spring Plungers, Black plastic-coated aluminium Handle with Red plastic knob.

KV Flow Factor
26.0.

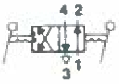
Principal Dimensions:



A	B	C	D	E	F	G	H	J	K	L	N	P	R	S	T	U	V
70	20.6	79	72	38	102	39.7	20	22.2	6.4	35.5	M6	M8	G½	42.8	57	M6	73



VR 50/3
2 pos. Spring return



VR 50/3L
2 pos. positive

VR 50/3UL
3 pos. positive.
Press. rel. neutral

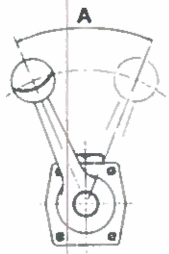
VR 50/3PL
3 pos. positive.
Press held neutral

VR 50/3U
3 pos. self-cent.
Press. rel. neutral

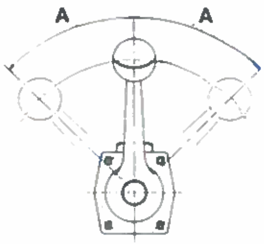
VR 50/3P
3 pos. self-cent.
Press. held neutral

Principal Dimensions

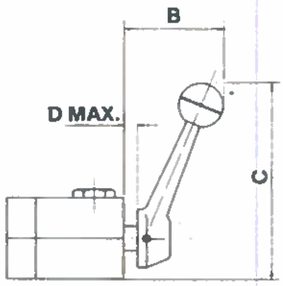
LEVER OPERATED — PANEL MOUNTING FACILITY



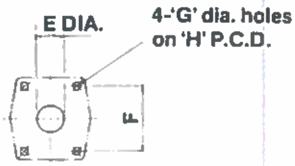
2 POSITION



3 POSITION



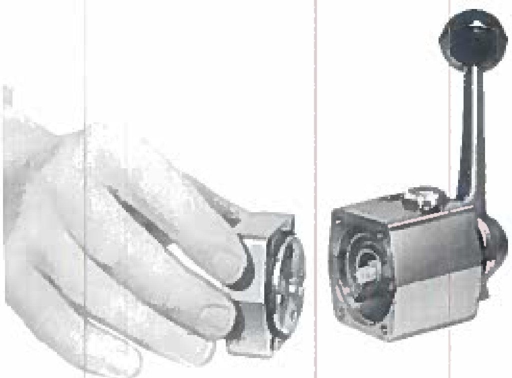
A	B	C	D
45°	89	171	12.7



Panel Drilling

E	F	G	H
23	57.1	7	73

Interchangeable Functions in the same Valve



A unique feature of the VR range is that either the Pressure Held Neutral or Pressure Release Neutral functions are available within the same valve.

If the alternative function is required to the one supplied ex-Works this can be obtained, quite simply, by reversing the position of the port block.

This is a simple 3 stage operation:

1. Unscrew the 4 cap screws and remove port block from valve body
2. Turn the port block through 180°
3. Replace the port block.

Note: After reversing the port block, the supply line must still be connected to the same relative port position previously used on the valve. i.e. port No. 3 becomes the supply port, with port No. 1 as exhaust, or vice versa.

Hard anodised aluminium port blocks as fitted to VR50 valves, must not be relapped.

Additional Notes

The lever handle operator detailed on the preceeding pages can be removed and refitted at 90° intervals if so required.

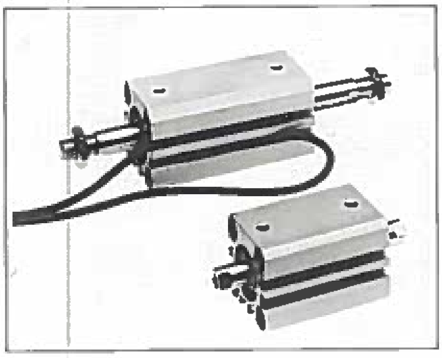
2 position spring return versions are normally supplied for manual clockwise operation, that is, viewed from the spindle end.

The versions can be adopted for counter-clockwise operation, if required, by carefully removing the screwed plug on top of the valve body and rotating the exposed plunger through 180°.

The basic valve is suitable for 3/2 operation with redundant outlet port plugged.

Super compact cylinders

Double acting through rod - SSD-D / SSD-DL series
12, 16, 20, 25, 32, 40, 50, 63mm bore



1. General description and application benefits

A range of double acting through rod compact cylinders in 8 bore sizes.

- Innovative design.
- 70% space saving over conventional ISO cylinders.
- Magnetic piston (option).
- Small switches fit within body envelope on three sides.
- Lube free.
- Through mounting holes tapped both ends.
- Non standard strokes available.

2. Functional symbol

Other models available

- Double acting - single rod
- Single acting - spring return
- Single acting - spring extend
- High temperature.
- Non rotating.
- Duplex.
- Back to back.

For further details see catalogue ref CC-N-285

3. Preferred model selection

Non magnetic piston

Bore	Model code	Stroke 5	10	15	20	25	30	40	50
12mm	SSD-D-12VxStroke-*	■	■	■	■	■	■		
16mm	SSD-D-16VxStroke-*	■	■	■	■	■	■		
20mm	SSD-D-20VxStroke-*	■	■	■	■	■	■		
25mm	SSD-D-25VxStroke-*	■	■	■	■	■	■	■	■
32mm	SSD-D-32VxStroke-*	■	■	■	■	■	■	■	■
40mm	SSD-D-40VxStroke-*	■	■	■	■	■	■	■	■
50mm	SSD-D-50VxStroke-*	■	■		■		■	■	■
63mm	SSD-D-63VxStroke-*	■	■		■		■	■	■

****= Option:- No mark = Piston rod with female thread, N = Piston rod with male thread and locknut.***

Ordering example:-

SSD-D-20Vx10 = 20mm bore double acting through rod cylinder x 10mm stroke.

Magnetic piston

Bore	Model code	Stroke 5	10	15	20	25	30	40	50
12mm	SSD-DL-12VxStroke-*	■	■	■	■	■	■		
16mm	SSD-DL-16VxStroke-*	■	■	■	■	■	■		
20mm	SSD-DL-20VxStroke-*	■	■	■	■	■	■		
25mm	SSD-DL-25VxStroke-*	■	■	■	■	■	■	■	■
32mm	SSD-DL-32VxStroke-*	■	■	■	■	■	■	■	■
40mm	SSD-DL-40VxStroke-*	■	■	■	■	■	■	■	■
50mm	SSD-DL-50VxStroke-*	■	■		■		■	■	■
63mm	SSD-DL-63VxStroke-*	■	■		■		■	■	■

****= Option:- No mark = Piston rod with female thread, N = Piston rod with male thread and locknut.***

Ordering example:-

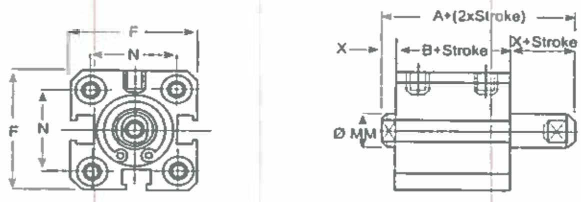
SSD-DL-40Vx30-N = 40mm bore double acting through rod cylinder x 30mm stroke with magnetic piston and piston rod with male thread.

4. Operating data

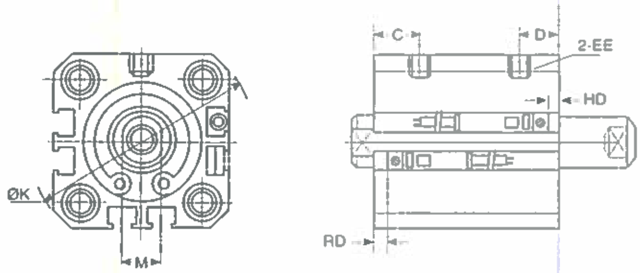
Operating pressure	1.0 - 10 bar (14.5 - 145 psig)
Ambient operating temperature range	-10° C to + 60° C (14 F to + 140° F)
Type of connection	Screwthread
Port size	M5 x 0.8, 1/8" BSP, 1/4" BSP
Materials of construction	Body & Piston - Aluminium alloy Piston rod - Stainless steel Front end covers - Aluminium alloy (Alumite) Rear end covers - Galvanised steel (12 - 25mm bore) Alumite (32 - 63mm bore) Seals - Nitrile rubber
Operating medium	Compressed air, filtered and lubricated or non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Installation dimensions	See overleaf
Mass	See catalogue ref CC-N-285
Service kits	SSD-D-**K (** = Bore size) *i.e. Spares kit for 32mm bore cylinder = SSD-D-32K*

5. Installation dimensions in mm

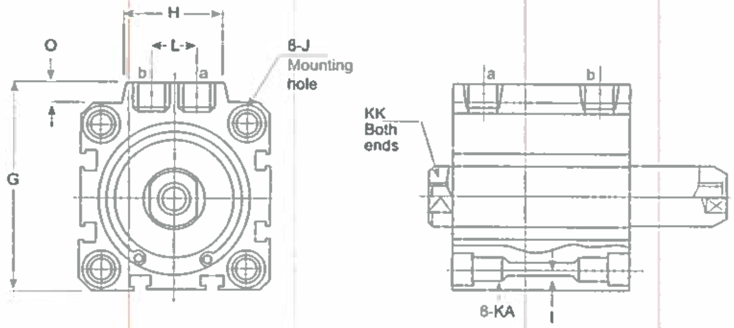
12, 16mm bore (SSD-D-**Vx**)



20, 25mm bore with switches (SSD-DL-**Vx**)



32, 40, 50mm bore (SSD-D-**Vx**)



Bore	Reed switch TOH		Proximity switch T3H	
	HD	RD	HD	RD
12	5.5	3.0	5.5	3.0
16	5.5	3.0	5.5	3.0
20	11.5	8.5	8.5	8.5
25	12.5	10.5	12.5	10.5
32	12.0	10.5	12.0	10.5
40	17.5	13.5	17.5	13.5
50	17.5	13.5	17.5	13.5
63	18.5	14.0	18.5	14.0

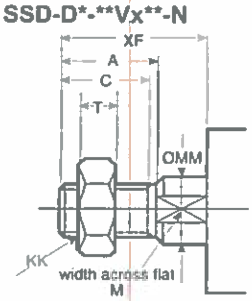
Bore	A(SSD-D)	B(SSD-D)	A(SSD-DL)	B(SSD-DL)	C	D	EE	F	G	H	I	J	K
12	29	22	34	27	5.5	5.5	M5x0.8	25	-	-	3.5	Counterbore 6.5 Ø x 3.5 deep	32
16	29	22	34	27	5.5	5.5	M5x0.8	29	-	-	3.5	Counterbore 6.5 Ø x 3.5 deep	38
20	35	26	45	36	8	8	M5x0.8	36	-	-	5.5	Counterbore 9 Ø x 5.5 deep	47
25	41	31	51	41	11	11	M5x0.8	40	-	-	5.5	Counterbore 9 Ø x 5.5 deep	51
32	44.5	30.5	54.5	40.5	8	8	G1/8"	45	49.5	24	5.5	Counterbore 9 Ø x 5.5 deep	60
40	53	39	63	49	12	12	G1/8"	52	57	24	5.5	Counterbore 9 Ø x 5.5 deep	69
50	55	39	65	49	10.5	10.5	G1/4"	64	71	33	6.9	Counterbore 11 Ø x 6.5 deep	86
63	57	41	67	51	13	13	G1/4"	77	84	33	8.7	Counterbore 14 Ø x 9 deep	103

Bore	KA	KK	L	M	MM	N	O	X
12	M4x0.7, 7 deep	M3x0.5, 6 deep	-	5	6	15.5	-	3.5
16	M4x0.7, 7 deep	M4x0.7, 8 deep	-	6	8	20	-	3.5
20	M6x1.0, 11 deep	M5x0.8, 7 deep	-	8	10	25.5	-	4.5
25	M6x1.0, 11 deep	M6x1.0, 12 deep	-	10	12	28	-	5
32	M8x1.25, 13 deep	M8x1.25, 13 deep	10	14	16	34	4.5	7
40	M8x1.25, 13 deep	M8x1.25, 13 deep	10	14	16	40	5	7
50	M8x1.25, 13 deep	M10x1.5, 15 deep	15	17	20	50	7	8
63	M10x1.5, 25 deep	M10x1.5, 15 deep	15	17	20	60	7	8

* **Versions with piston rod through hole for mounting of vacuum cups are available. For details consult Customer Services Department.**

6. Dimensions in mm of piston rod with male thread

SSD-D*-**Vx**-N



Bore	A	C	KK	M	MM	T	XF
12	10.5	9	M5x0.8	5	6	3.2	14
16	12	10	M6x1.0	6	8	3.6	15.5
20	14	12	M8x1.25	8	10	5	18.5
25	17.5	15	M10x1.25	10	12	6	22.5
32	23.5	20.5	M14x1.5	14	16	8	28.5
40	23.5	20.5	M14x1.5	14	16	8	28.5
50	28.5	26	M18x1.5	17	20	11	33.5

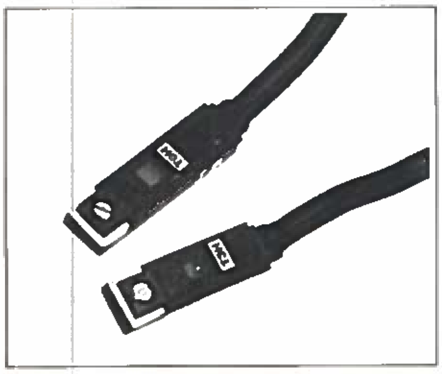
VICKERS

Pneumatics

Super compact cylinders

Magnetic sensors - Proximity switch Type T3H and Reed switch Type T0H

12, 16, 20, 25, 32, 40, 50, 63mm



1. General description and application benefits

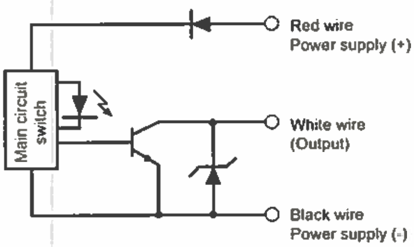
Continuously rated proximity and reed switches with LED indicator and flying lead.

Programmable controller relay operation.

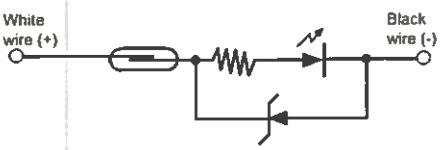
- Switches fit within cylinder body envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagrams of switches

Proximity switch T3H3



Reed switch T0H3



3. Preferred model selection

Proximity switch

Model code	Description
T3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
T3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

Reed switch

Model code	Description
T0H3	Axial lead wire reed switch with 3metre flying lead (Standard)
T0H5	Axial lead wire reed switch with 5 metre flying lead (Optional)

4. Operating data

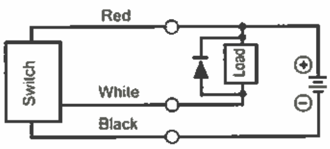
Ambient operating temperature range	-10° C to + 60° C (14 F to + 140° F)
Load voltage/current	T3H3 - 30vDC or less/100mA or less T0H3 - 12, 24vDC/ 5 to 50mA 110vAC/ 7 to 20mA
Power consumption	T3H3 - 24vDC (ON) 10mA or less
Leakage current	T3H3 - 10 μA or less
Maximum impulse	T3H3 - 100G T0H3 - 30G
Protection	IEC standard IP67
Lead wire	T3H3 - Oil proof 3 core vinyl cabtyre cord 0.2mm^2 T0H3 - Oil proof 2 core vinyl cabtyre cord 0.2mm^2
Insulation resistance	More than 20MΩ at 500v DC megger
LED indication	Red (ON)

5. Installation requirements

Proximity switch T3H*

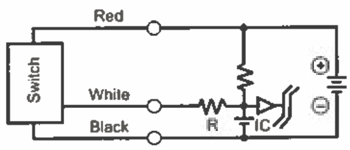
Output circuit protection

When an inductive load (relay or solenoid valve) is connected, be sure to install the protection circuit shown below in order to protect from the surge voltage generated when the switch is turned OFF.



Example of surge absorbing element (diode) jointly used as the inductive load. Use Hitachi diode VO6 or equivalent

When a capacitive load (condenser) is connected, be sure to install the protection circuit shown below in order to protect from the inrush current generated when the switch is turned ON.

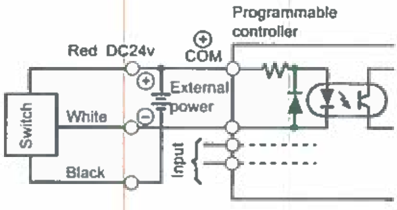


Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0.10 = R (Ω)

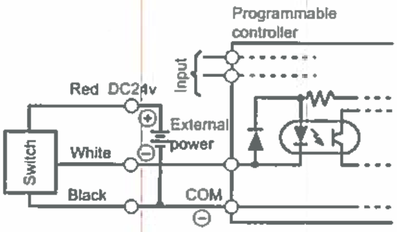
5. Installation requirements (cont)

Proximity switch T3H* (cont)

Connection to programmable controller (sequencer)
The connecting method differs according to the type of programmable controller.
Make connections as shown below.



Example of switch T3H3 connection to source input (external power) type.



Example of switch T3H3 connection to source input (built - in power) type.
The switch cannot be connected to the sink input sequencer.

Reed switch T0H*

Magnetic environment
Avoid using at places with strong magnetic field and high current (large magnet, spot welder, etc.) in the surroundings. When making proximity connection of cylinders with switches in parallel, the magnetic substance moving at the vicinity of the cylinder may cause matual interference, affecting the detecting accuracy.

Lead wire connection
Be sure to connect the lead wire of the switch to a load in series, instead of connecting it directly to the power source.

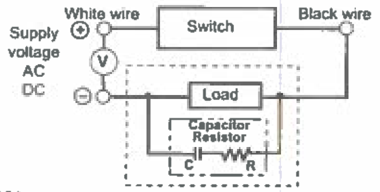
A For DC, white wire is the positive (+) side and the black wire the negative (-) side.
If connected inverse, the switch activates, but the lamp fails to light.

B To connect the lead wire to an AC relay or input terminal of the programmable controller , the lamp of the switch may not light if each circuit is half-wave rectification. In such cases reverse the polarity of the connection, then the lamp will light.

Contact capacity
Avoid using the load with the capacity exceeding the maximum contact capacity of the switch. When the current is below the rated current level, the switch lamp may fail to light.

Contact protection
When using for the inductive load (such as relay, etc.), be sure to install the contact protection circuits shown below.

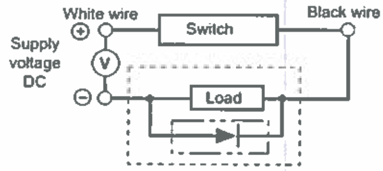
- When using capacitor and resistance



Wired by user

Protection circuit (spark quenching circuit)
Recommended value capacitor C 0.033 - 0.1μF
Resistor R 1 - 3KΩ
By Okaya Denki XEBIKI or equivalent

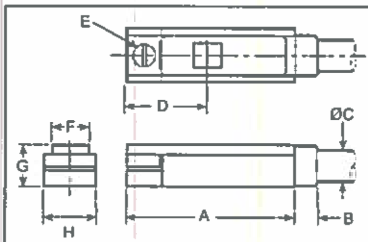
- When using diode



Wired by user

Protection
General rectifier diode
By Hitachi V06 or equivalent

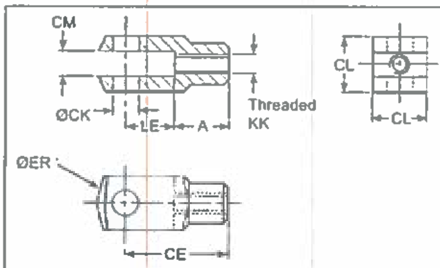
6. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	H
T3H3	18.5	2.5	3.4	9	M2.5	4.5	4.7	6
T0H3	22.5	2.5	3.4	9	M2.5	4.5	4.7	6

Accessories for piston rods with male thread

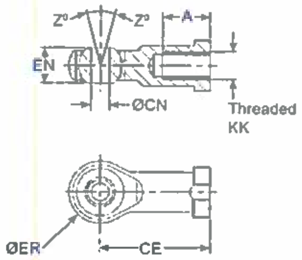
Rod clevis with pivot pin



Model code	
Bore	
12	C015S - FEK
16	C012S - FEK
20	C020S - FEK
25	C025S - FEK

Bore	A	CE	CK	CL	CM	ER	KK	LE
12	10	20	5	10	5	16	M5x0.80	10
16	12	24	6	12	6	14	M6x1.00	12
20	16	32	8	16	8	20	M8x1.25	16
25	20	40	10	20	10	16	M10x1.25	20

Rod spherical bearing



Model code	
Bore	
16	C012S - SREK
20	C020S - SREK
25	C025S - SREK

Bore	A	CE	CN	EN	ER	KK	Z°
16	12	30	6	9	20	M6x1.00	4°
20	16	36	8	12	24	M8x1.25	4.5°
25	20	43	10	14	28	M10x1.25	4.5°

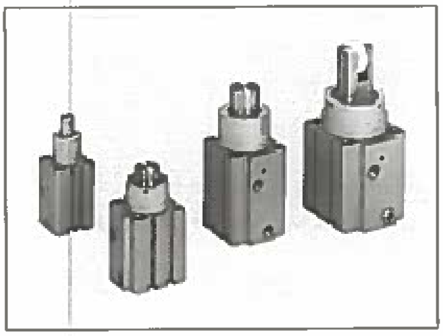
Printed in Great Britain

GB-P5001-SCC-0595

VICKERS **Pneumatics**

CKD Stopper cylinders for conveyor lines

Single acting / Double acting - STK series
20, 32, 40, 50mm bore

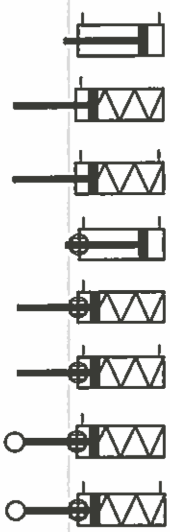


1. General description and application benefits

Compact, lightweight double acting, single acting spring extend and double acting spring extend cylinders with high resistance to lateral loads for conveyor line applications.
Space saving square body design with through mounting holes tapped both ends.
Piston rod available as round end type, chamfered end type and roller end type as standard with female threaded end as an option.

- High resistance to lateral loads.
- Various rod designs.
- High speed - up to 500mm/sec.
- Magnetic piston as standard.
- 96 models available.
- Small switches fit into integral body rail.
- Buffer cushioning.

2. Functional symbols



STK--**-*****
Double acting, round rod end.

STK-Y--**-*****
Single acting spring extend, round rod end.

STK-Y1--**-*****
Double acting spring extend, round rod end.

STK-M--**-*****
Double acting, chamfered rod end.

STK-MY--**-*****
Single acting spring extend, chamfered rod end.

STK-MY1--**-*****
Double acting spring extend, chamfered rod end.

STK-JY--**-*****
Single acting spring extend, roller rod end.

STK-JY1--**-*****
Double acting spring extend, roller rod end.

3. Model code

S T K - * * * - * * - * * - * * *
[1] [2] [3] [4]

[1] Model
None = Double acting, round rod end
Y = Single acting spring extend, round rod end
Y1 = Double acting spring extend, round rod end
M = Double acting, chamfered rod end
MY = Single acting spring extend, chamfered rod end
MY1 = Double acting spring extend, chamfered rod end
JY = Single acting spring extend, roller rod end
JY1 = Double acting spring extend, roller rod end

[2] Bore
20 = 20mm
32 = 32mm
40 = 40mm
50 = 50mm

[3] Standard strokes
For 20mm and 32mm bore
10 = 10mm
15 = 15mm
20 = 20mm
For 40mm and 50mm bore
20 = 20mm
25 = 25mm
30 = 30mm

[4] Option
N11 = Female threaded rod end
(Not applicable to models STK-JY and STK-JY1)

Standard model selection

ROUND ROD END
Double acting

Model code	Stroke 10	15	20	25	30
STK-20-Stroke	■	■	■		
STK-32-Stroke	■	■	■		
STK-40-Stroke			■	■	■
STK-50-Stroke			■	■	■

Single acting spring extend

Model code	Stroke 10	15	20	25	30
STK-Y-20-Stroke	■	■	■		
STK-Y-32-Stroke	■	■	■		
STK-Y-40-Stroke			■	■	■
STK-Y-50-Stroke			■	■	■

Double acting spring extend

Model code	Stroke 10	15	20	25	30
STK-Y1-20-Stroke	■	■	■		
STK-Y1-32-Stroke	■	■	■		
STK-Y1-40-Stroke			■	■	■
STK-Y1-50-Stroke			■	■	■

CHAMFERED ROD END (non rotating)
Double acting

Model code	Stroke 10	15	20	25	30
STK-M-20-Stroke	■	■	■		
STK-M-32-Stroke	■	■	■		
STK-M-40-Stroke			■	■	■
STK-M-50-Stroke			■	■	■

Single acting spring extend

Model code	Stroke 10	15	20	25	30
STK-MY-20-Stroke	■	■	■		
STK-MY-32-Stroke	■	■	■		
STK-MY-40-Stroke			■	■	■
STK-MY-50-Stroke			■	■	■

Double acting spring extend

Model code	Stroke 10	15	20	25	30
STK-MY1-20-Stroke	■	■	■		
STK-MY1-32-Stroke	■	■	■		
STK-MY1-40-Stroke			■	■	■
STK-MY1-50-Stroke			■	■	■

ROLLER ROD END
Single acting spring extend

Model code	Stroke 10	15	20	25	30
STK-JY-20-Stroke	■	■	■		
STK-JY-32-Stroke	■	■	■		
STK-JY-40-Stroke			■	■	■
STK-JY-50-Stroke			■	■	■

ROLLER ROD END
Double acting spring extend

Model code	Stroke 10	15	20	25	30
STK-JY1-20-Stroke	■	■	■		
STK-JY1-32-Stroke	■	■	■		
STK-JY1-40-Stroke			■	■	■
STK-JY1-50-Stroke			■	■	■

4. Operating data

Maximum operating pressure	10.2 bar (148 psig)		
Minimum operating pressure	Double acting	20mm bore	1.5 bar (21.7 psig)
		32, 40, 50mm bore	1.0 bar (14.5 psig)
	Double acting spring extend	20mm bore	2.2 bar (31.9 psig)
		32, 40, 50mm bore	1.2 bar (17.4 psig)
	Single acting spring extend	20mm bore	2.2 bar (31.9 psig)
		32, 40, 50mm bore	1.2 bar (17.4 psig)
Ambient operating temperature range	-10° C to + 60° C (14° F to + 140° F)		
Materials of construction	Cylinder body and rod end covers - Anodised aluminium alloy End cover - Zinc plated steel (20mm bore) Anodised aluminium alloy (32, 40, 50mm bore) Piston - Stainless steel Piston rod - Chrome plated stainless steel (20mm bore) Chrome plated steel (32, 40, 50mm bore) Piston rod bush - Copper Seals and packing - Nitrile Spring - Electrocoated steel		
Cushioning	Urethane rubber damper		
Type of connection	Screwthread		
Port size	20mm bore	M5 x 0.8	
	32, 40mm bore	Rc1/8"	
	50mm bore	Rc1/4"	
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil. *NOTE: Once lubricated this must be continued for full service life.*		
Piston speed	50 - 500mm/sec		
Stroke tolerance	+2.0mm, -0.0mm		
Piston rod thrusts and technical data	See pages STK 1.3 and STK 1.4		
Typical applications	See page STK 1.5		
Installation dimensions	Cylinders with round rod end - see page STK 1.6 Cylinders with female threaded rod end, chamfered rod end and roller rod end - see page STK 1.7		
Magnetic sensors	See page STK 2.1		

Mass (kg)

Round rod end:

STK-20-10	2.14kg	STK-Y-20-10	2.17kg	STK-Y1-20-10	2.17kg
STK-20-15	2.29kg	STK-Y-20-15	2.32kg	STK-Y1-20-15	2.32kg
STK-20-20	2.43kg	STK-Y-20-20	2.46kg	STK-Y1-20-20	2.46kg
STK-32-10	4.38kg	STK-Y-32-10	4.54kg	STK-Y1-32-10	4.54kg
STK-32-15	4.63kg	STK-Y-32-15	4.79kg	STK-Y1-32-15	4.79kg
STK-32-20	4.88kg	STK-Y-32-20	5.04kg	STK-Y1-32-20	5.04kg
STK-40-20	7.93kg	STK-Y-40-20	8.09kg	STK-Y1-40-20	8.09kg
STK-40-25	8.34kg	STK-Y-40-25	8.50kg	STK-Y1-40-25	8.50kg
STK-40-30	8.75kg	STK-Y-40-30	8.91kg	STK-Y1-40-30	8.91kg
STK-50-20	12.85kg	STK-Y-50-20	12.99kg	STK-Y1-50-20	12.99kg
STK-50-25	13.11kg	STK-Y-50-25	13.25kg	STK-Y1-50-25	13.25kg
STK-50-30	13.37kg	STK-Y-50-30	13.51kg	STK-Y1-50-30	13.51kg

Chamfered rod end — As above plus 0.01kg for 20mm bore units
0.03kg for 32, 40 and 50mm bore units.

Roller rod end — As above plus 0.11kg for 20mm bore units
0.44kg for 32mm bore units
0.69kg for 40mm bore units
0.77kg for 50mm bore units

Service kits

Double acting units		Double acting spring extend units	
20mm bore units	STK - 20K	20mm bore units	STK - Y1 - 20K
32mm bore units	STK - 32K	32mm bore units	STK - Y1 - 32K
40mm bore units	STK - 40K	40mm bore units	STK - Y1 - 40K
50mm bore units	STK - 50K	50mm bore units	STK - Y1 - 50K

Single acting spring extend units	
20mm bore units	STK - Y - 20K
32mm bore units	STK - Y - 32K
40mm bore units	STK - Y - 40K
50mm bore units	STK - Y - 50K

5. Theoretical thrusts

Double acting types STK and STK-M

Piston thrust (N)											
	PUSH	Air pressure (bar)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
		20mm bore	-	63	94	126	157	188	220	251	283
		32mm bore	80	161	241	322	402	482	563	643	724
		40mm bore	126	251	377	502	628	754	879	1005	1130
		50mm bore	196	393	589	785	982	1178	1374	1570	1767
	PULL	Air pressure (bar)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
		20mm bore	-	40	60	80	101	121	141	161	181
		32mm bore	49	98	147	196	245	294	343	392	441
		40mm bore	77	153	230	306	383	459	536	613	689
		50mm bore	126	251	377	503	628	754	880	1005	1131

Single acting spring extend types STK-Y, STK-MY and STK-JY

Piston thrust (N)											
	PULL	Air pressure (bar)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
		20mm bore	-	-	45	65	86	106	126	146	166
		32mm bore	-	66	115	164	213	262	311	360	409
		40mm bore	-	108	185	261	338	414	491	568	644
		50mm bore	-	164	290	416	541	667	793	918	1044

Spring tension (N)							
	EXTENSION	Stroke	10	15	20	25	30
		20mm bore	12	10	8.4	-	-
		32mm bore	25	22	18	-	-
		40mm bore	-	-	30	26	22
		50mm bore	-	-	57	49	42
	COMPRESSION	Stroke	10	15	20	25	30
		20mm bore	15	15	15	-	-
		32mm bore	32	32	32	-	-
		40mm bore	-	-	45	45	45
		50mm bore	-	-	87	87	87

Double acting spring extend types STK-Y1, STK-MY1 and STK-JY1

Piston thrust (N)											
	PUSH	Air pressure (bar)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
		20mm bore	-	-	94	126	157	188	220	251	283
		32mm bore	-	161	241	322	402	482	563	643	724
		40mm bore	-	251	377	502	628	754	879	1005	1130
		50mm bore	-	393	589	785	982	1178	1374	1570	1767
	PULL	Air pressure (bar)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
		20mm bore	-	-	45	65	86	106	126	146	166
		32mm bore	-	66	115	164	213	262	311	360	409
		40mm bore	-	108	185	261	338	414	491	568	644
		50mm bore	-	164	290	416	541	667	793	918	1044

Spring tension (N)							
	EXTENSION	Stroke	10	15	20	25	30
		20mm bore	12	10	8.4	-	-
		32mm bore	25	22	18	-	-
		40mm bore	-	-	30	26	22
		50mm bore	-	-	57	49	42
	COMPRESSION	Stroke	10	15	20	25	30
		20mm bore	15	15	15	-	-
		32mm bore	32	32	32	-	-
		40mm bore	-	-	45	45	45
		50mm bore	-	-	87	87	87

6. Technical data

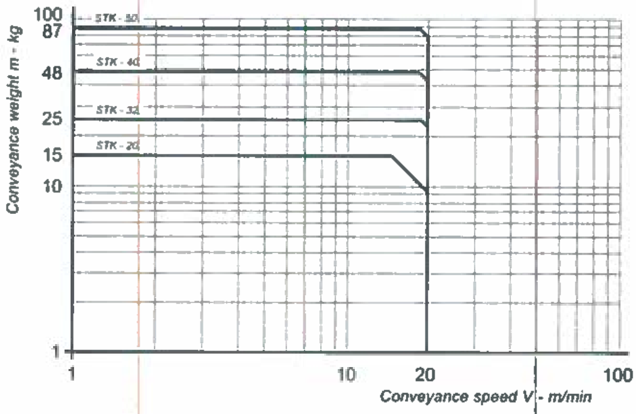
Cylinder selection guide

The allowable energy absorption depends on the mounting method employed - mounting at rod end or mounting at head end.

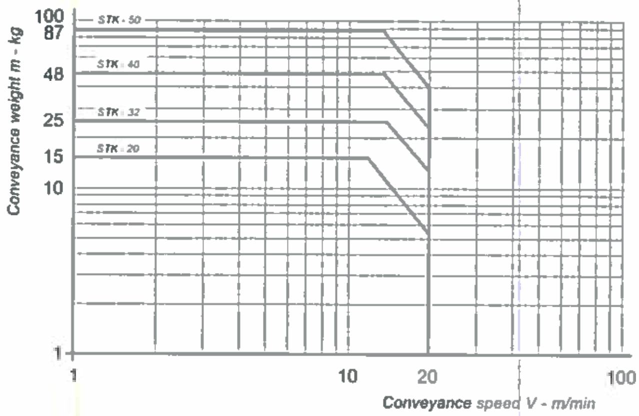
Using the graphs below select the model size to be used for a conveyance speed V (m/min) of a conveyance weight m (kg) using the graph appropriate to mounting method used.

Note: Graphs apply to all rod end shapes - round, chamfered and roller.

Allowable energy absorption with cylinder mounted at rod end



Allowable energy absorption with cylinder mounted at head end



Lateral load and operating pressure

The minimum working pressure depends on the lateral load applied to the rod end.

1. Calculate the horizontal load F which is to be applied to the rod end.

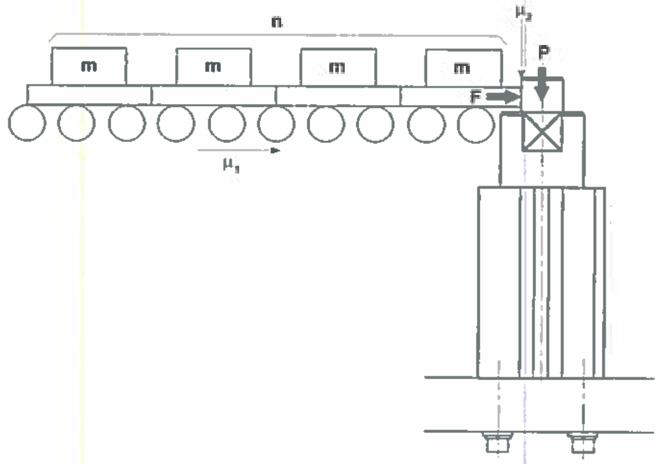
$$F = 10 \times m \times n \times \mu_1$$

F = lateral load (N)
m = conveyance weight (kg)
n = conveyance quantity
μ_1 = friction coefficient between conveyance pallet and conveyor

Compare cylinder selection with table below:-

Allowable lateral loads (N)

Bore	Stroke 10	Stroke 15	Stroke 20	Stroke 25	Stroke 30
20	106.5	99.4	93.2	-	-
32	272.8	254.6	238.7	-	-
40	-	-	371.3	352.1	334.8
50	-	-	582.8	552.8	525.8



The friction coefficients depend on the material of the conveyance object:-

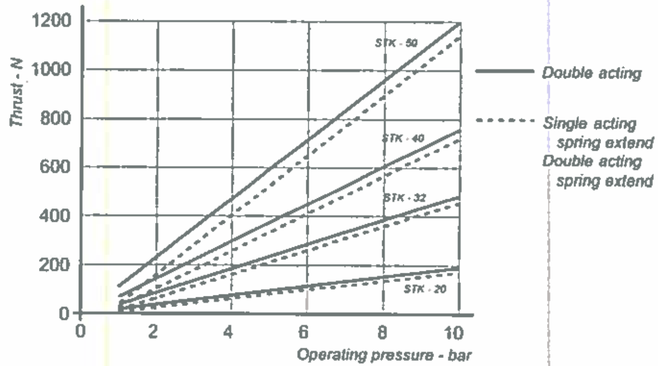
Object material	Steel	Aluminium	Urethane
μ_1 and μ_2	0.5	0.8	2.0

2. Calculate the required cylinder thrust.

$$P = F \times \mu_2$$

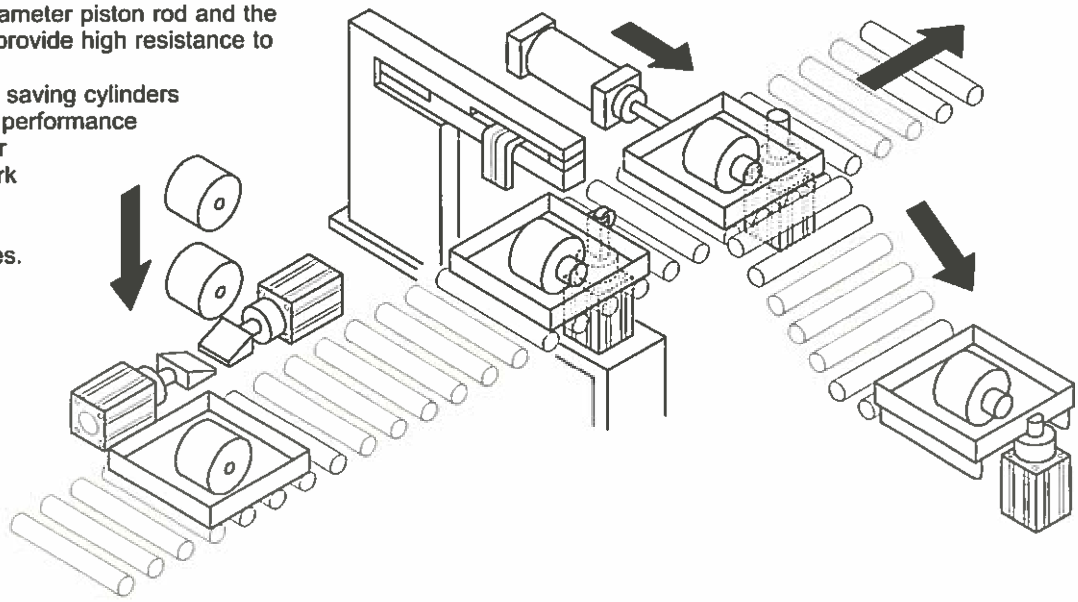
P = thrust (N)
μ_2 = friction coefficient between conveyance object and rod

Compare cylinder selection with graph on right showing thrust values and operating pressures

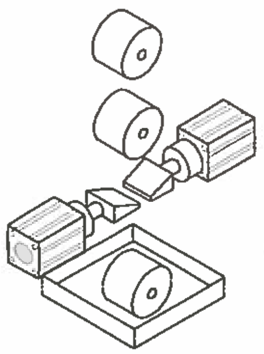


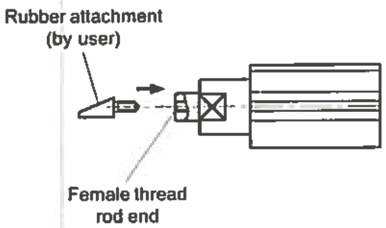
7. Applications

The larger diameter piston rod and the longer bush provide high resistance to lateral load.
These space saving cylinders provide high performance in stopping or changing work direction functions on conveyor lines.



Round rod end type



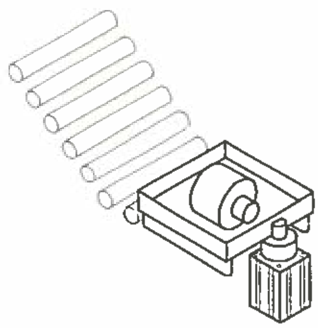


The optional female thread rod end allows various additions such as rubber attachments to prevent damage to work being handled.

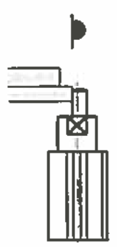
Characteristics of single acting spring extend types.
In the event of loss of air supply the spring inside the cylinder returns the rod to the extended (safe) position.

Characteristics of double acting spring extend types.
These double acting cylinders provide improved rod extending speeds particularly when jigs etc are attached to rod end.

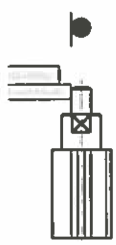
Chamfered rod end type



The flat surface on the rod end reduces stress of lateral load and provides less damage and wear compared to round end type.



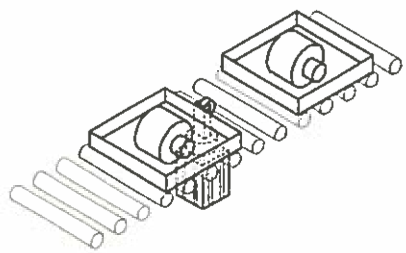
Chamfered rod end type



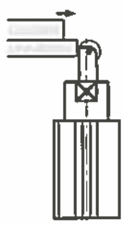
Round rod end type

Chamfered rod end type also provides non rotating function.

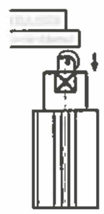
Roller rod end type



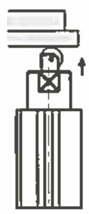
The roller rod end type cylinder reduces the cycle time of conveyor line and also eliminates the need of a switch to detect load position.



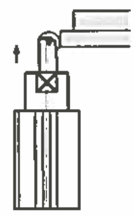
1) Stop pallet.



2) Rod lowered by supplied air - pallet transfer will commence.



3) Rod raised by spring tension on release of air pressure. Roller rises to underside of pallet and position held.

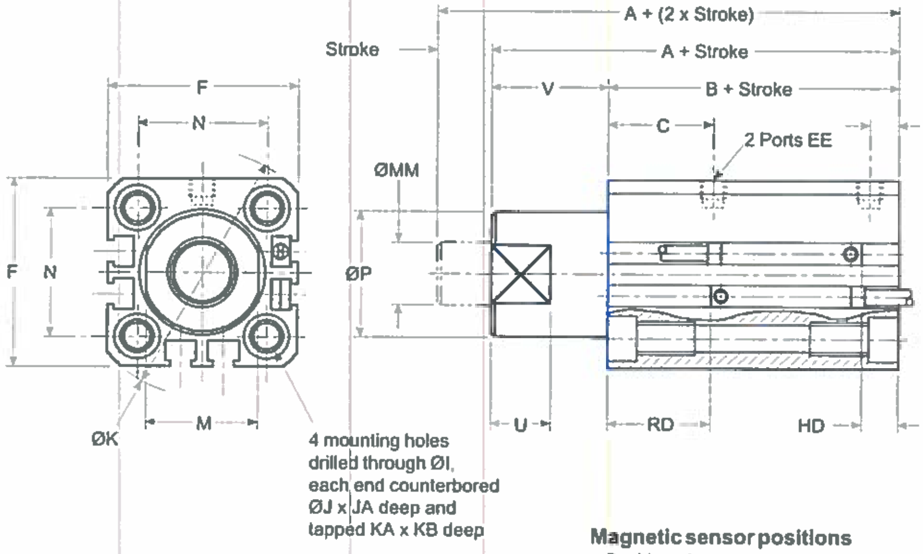


4) Rod returned to fully extended position by spring tension after pallet transfer is complete.

8. Installation dimensions in mm

(Basic cylinders with round rod end STK, STK-Y, STK-Y1)

20mm bore



Magnetic sensor positions

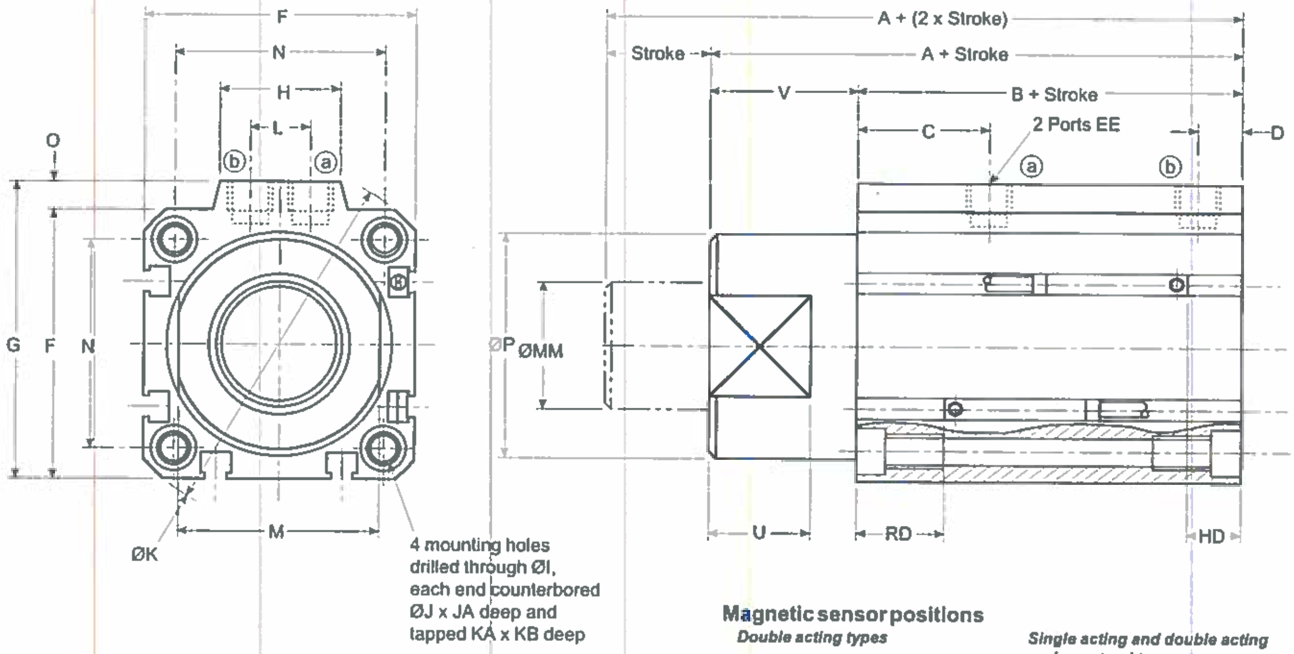
Double acting types

Bore	HD	RD
20	5.5	21

Single acting and double acting spring extend types

Bore	HD	RD
20	7.0	19.5

32, 40, 50mm bore



Magnetic sensor positions

Double acting types

Bore	HD	RD
32	9.5	21
40	10.5	24
50	11.5	24

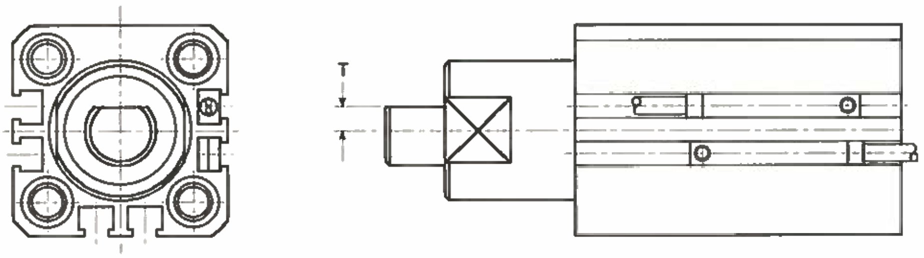
Single acting and double acting spring extend types

Bore	HD	RD
32	10.5	20
40	11.5	23
50	12.5	23

Bore	A	B	C	D	EE	F	G	H	I	J*	JA	K	KA	KB	L	M	MM	N	O	P	U	V
20	67	45	20	5.5	M5x0.8	36	-	-	5.5	9	5.5	47	M6x1.0	11	-	22	12	25.5	-	24	11	22
32	68	48	20	8	Rc1/8"	45	49.5	24	5.5	9	5.5	60	M6x1.0	11	10	32	20	34	4.5	36	13	20
40	80.5	52.5	24.5	8.5	Rc1/8"	52	57	24	5.5	9	5.5	69	M6x1.0	11	10	41	25	40	5	44	15	28
50	82	54	24.5	10.5	Rc1/4"	64	71	33	6.9	11	6.5	86	M8x1.25	13	15	55	30	50	7	56	15	28

* Spot faced

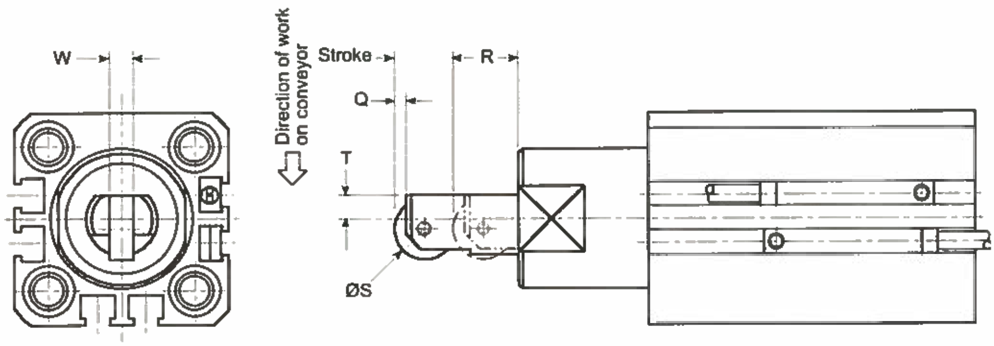
9. Installation dimensions in mm
(Basic cylinders with chamfered rod end STK-M, STK-MY, STK-MY1)



Bore	T
20	4
32	8
40	10
50	12

All other dimensions as for basic cylinders with round rod end shown opposite (page STK 1.6)

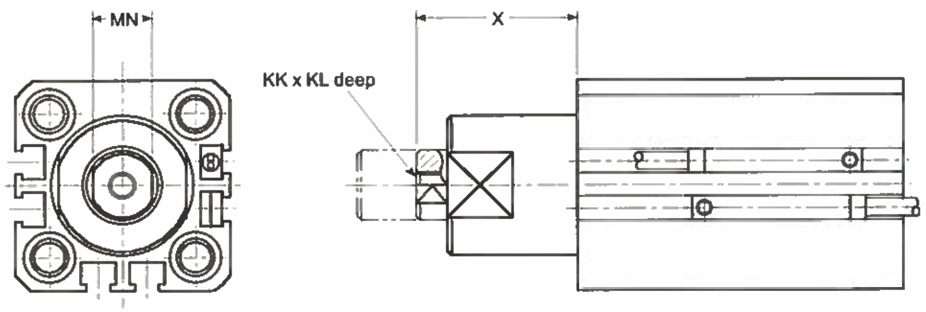
10. Installation dimensions in mm
(Cylinders with roller rod end STK-JY, STK-JY1)



Bore	Q	R	S	T	W
20	2	11	10	4	4
32	3	19	18	8	8
40	4	25	24	10	9
50	4	25	28	12	10

All other dimensions as for basic cylinders with round rod end shown opposite (page STK 1.6).

11. Installation dimensions in mm
(Basic cylinders with female threaded rod end STK - *** - ** - ** - N11)



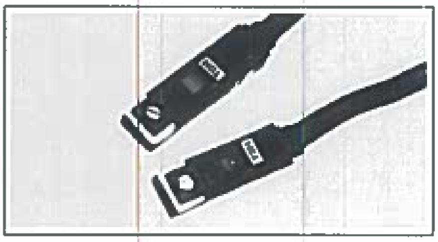
Bore	KK	KL	MN	X
20	M5x0.8	7	10	27
32	M8x1.25	13	17	30
40	M8x1.25	13	22	38
50	M10x1.5	15	27	43

All other dimensions as for basic cylinders with round rod end shown opposite (page STK 1.6) and basic cylinders with chamfered rod end shown above.

CKD Stopper cylinders for conveyor lines

Magnetic sensors - Reed switch Type T0H and Proximity switch Type T3H

20, 32, 40, 50mm



1. General description and application benefits

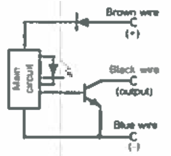
Continuously rated reed and proximity switches with LED indicator and flying lead. Programmable controller relay operation.

- Switches fit within cylinder body envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagrams of switches

Reed switch T0H*

Proximity switch T3H*



3. Preferred model selection

Reed switch

Model code	Description
T0H3	Axial lead wire reed switch with 3metre flying lead (Standard)
T0H5	Axial lead wire reed switch with 5 metre flying lead (Optional)

Proximity switch

Model code	Description
T3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
T3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

4. Operating data

Ambient operating temperature range	-10° C to + 60° C (14 F to + 140° F)
Load voltage/current	T0H - 12, 24vDC / 5 to 50mA 100/110vAC / 7 to 20mA T3H - 30vDC or less / 100mA or less
Power consumption	T3H - 24vDC (ON) 10mA or less
Leakage current	T3H - 10 μA or less
Maximum impulse	T0H - 30G T3H - 100G
Protection	IEC standard IP67
Lead wire	T0H - Oil proof 2 core vinyl cabtyre cord 0.2mm² T3H - Oil proof 3 core vinyl cabtyre cord 0.2mm²
Insulation resistance	More than 20MΩ at 500v DC megger
LED indication	Red (ON)

Note: *Self diagnosis proximity switch also available. Contact customer service for details.*

5. Installation requirements

Reed switch T0H*

Magnetic environment

Avoid using at places with strong magnetic field and high current (large magnet, spot welder, etc.) in the surroundings. When making proximity connection of cylinders with switches in parallel, the magnetic substance moving at the vicinity of the cylinder may cause matual interference, affecting the detecting accuracy.

Lead wire connection

Be sure to connect the lead wire of the switch to a load in series, instead of connecting it directly to the power source.

[A] For DC, Brown wire is the positive (+) side and the blue wire the negative (-) side.
If connected inverse, the switch activates, but the lamp fails to light.

[B] To connect the lead wire to an AC relay or input terminal of the programmable controller , the lamp of the switch may not light if each circuit is half-wave rectification. In such cases reverse the polarity of the connection, then the lamp will light.

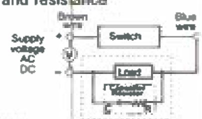
Contact capacity

Avoid using the load with the capacity exceeding the maximum contact capacity of the switch. When the current is below the rated current level, the switch lamp may fail to light.

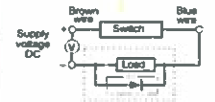
Contact protection

When using for the Inductive load (such as relay, etc.), be sure to install the contact protection circuits shown below.

When using capacitor and resistance

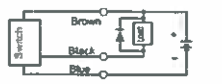


When using diode



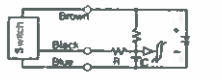
Proximity switch T3H*

Output circuit protection



Example of surge absorbing element (diode) jointly used as the inductive load. Use Hitachi diode V06 or equivalent

When an inductive load (relay or solenoid valve) is connected, be sure to install the protection circuit shown left in order to protect from the surge voltage generated when the switch is turned OFF.

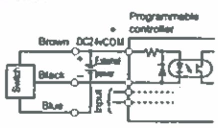


Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0.10 = R (Ω)

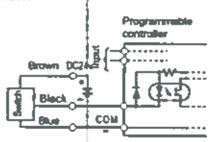
When a capacitive load (condenser) is connected, be sure to install the protection circuit shown left in order to protect from the inrush current generated when the switch is turned ON.

Connection to programmable controller (sequencer)

The connecting method differs according to the type of programmable controller.
Make connections as shown below.

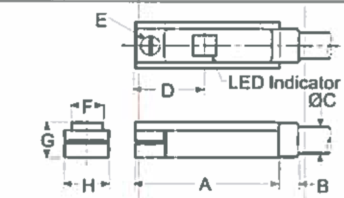


Example of switch T3H connection to source input (external power) type.*



Example of switch T3H connection to source input (built - in power) type. The switch cannot be connected to the sink input sequencer.*

6. Installation dimensions in mm



Model code	A	B	C	D	E	F	G	H
T0H3	22.5	2.5	3.4	9	M2.5	4.5	4.7	6
T3H3	18.5	2.5	3.4	9	M2.5	4.5	4.7	6

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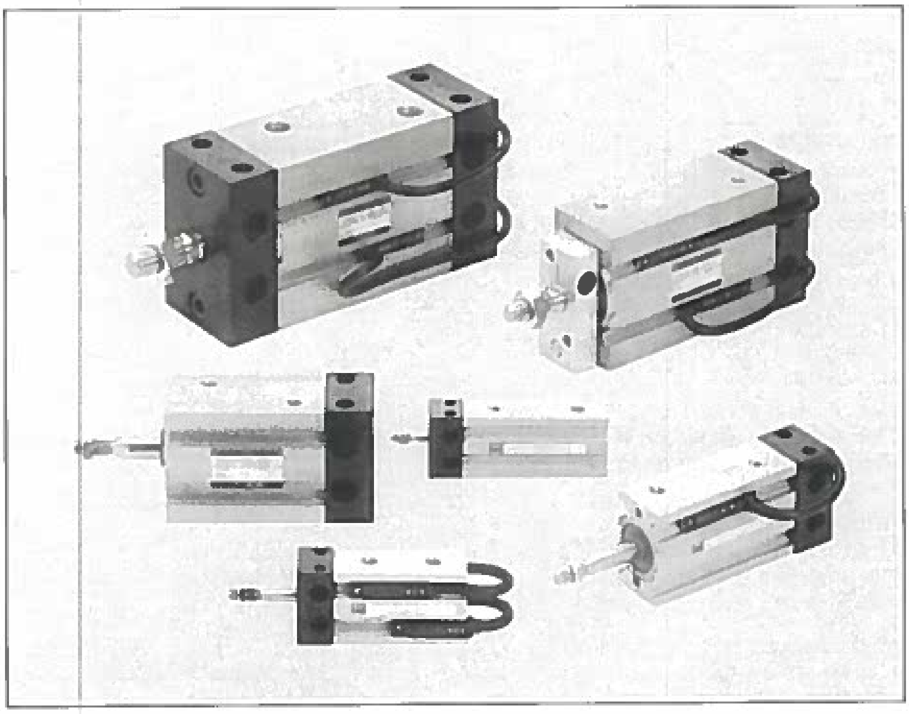
GB-P5045-STK-1096

CKD Super mount cylinder

Single acting and double acting - SMD2 series
6, 10, 16, 20, 25, 32mm bore



1. General description and application benefits

A range of single and double acting cylinders of compact rectangular shape with mounting on any face.

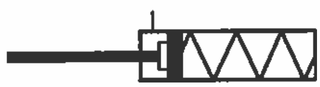
- Lightweight.
- Space saving.
- 3 mounting styles giving direct mounting on any face.
- Magnetic piston (option).
- Small switches fit within main body.
- Single acting spring return and spring extend types available.
- Version available with non rotating piston.

2. Functional symbols

SMD2-*-**-**-**

SMD2-X*-**-**-**

SMD2-Y*-**-**-**



SMD2-M*-**-**-**

3. Model code

S M D 2 - * * - * * - * * - * *

[1] [2] [3] [4] [5]

[1] Function
No mark = Double acting
M = Double acting, non rotating
X = Single acting, spring return
Y = Single acting, spring extend

[2] Type
No mark = Non magnetic piston
L = Magnetic piston

[3] Mounting style
DA = Rod side mount
DB = Head side mount
DC = Heavy duty mount
No mark = Non rotating cylinder (Head side mount only)

[4] Bore
6 = 6mm
10 = 10mm
16 = 16mm
20 = 20mm
25 = 25mm
32 = 32mm

[5] Stroke
See preferred tables on following pages:-
Double acting - page SMD 2.1
Double acting, non rotating - page SMD 5.1
Single acting, spring return - page SMD 3.1
Single acting, spring extend - page SMD 4.1

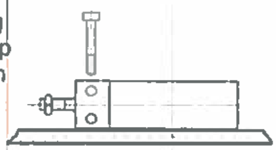
4. Operating data

Operating pressure	Double acting	6mm bore	1.5 - 7.0 bar (21.3 - 100 psig)
		10 to 32mm bore	1.0 - 7.0 bar (14.2 - 100 psig)
	Single acting (spring return)	6mm bore	3.0 - 7.0 bar (42.6 - 100 psig)
		10 to 25mm bore	2.0 - 7.0 bar (28.4 - 100 psig)
		32mm bore	1.5 - 7.0 bar (21.3 - 100 psig)
	Single acting (spring extend)	6mm bore	3.5 - 7.0 bar (49.8 - 100 psig)
		10 to 25mm bore	2.0 - 7.0 bar (28.4 - 100 psig)
		32mm bore	1.5 - 7.0 bar (21.3 - 100 psig)
Ambient operating temperature range	-10° C to + 60° C (14° F to + 140° F)		
Type of connection	Screwthread	- M5 (6 to 25mm bore)	
		- G1/8" (32mm bore)	
Materials of construction	Cylinder body	- Anodised aluminium alloy	
	Piston rods	- Stainless steel	
	Piston	- Aluminium alloy	
	Seals	- Nitrile rubber	
	Mount	- Aluminium alloy	
Cushioning	Fixed rubber buffer		
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil.		
Piston speed	50 - 500mm/sec		
Piston rod thrust (N)	Double acting	see page SMD 2.1	
	Double acting (non rotating)	see page SMD 5.1	
	Single acting (spring return)	see page SMD 3.1	
	Single acting (spring extend)	see page SMD 4.1	
Installation dimensions	Double acting	see page SMD 2.2	
	Double acting (non rotating)	see page SMD 5.2	
	Single acting (spring return)	see page SMD 3.2	
	Single acting (spring extend)	see page SMD 4.2	
Magnetic sensors	See pages SMD 6.1-2		
Mass (kg)	Double acting	see page SMD 2.1	
	Double acting (non rotating)	see page SMD 5.1	
	Single acting (spring return)	see page SMD 3.1	
	Single acting (spring extend)	see page SMD 4.1	
Service kits	Double acting	see page SMD 2.1	
	Double acting (non rotating)	see page SMD 5.1	
	Single acting (spring return)	see page SMD 3.1	
	Single acting (spring extend)	see page SMD 4.1	

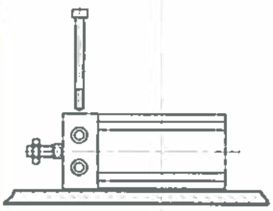
5. Mounting details

DA style - Rod side mount

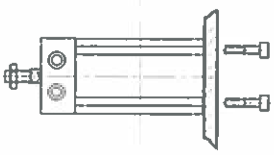
Mounting on the top or bottom surface



Mounting on the side surface

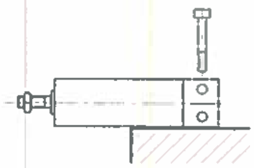


Mounting on the head side

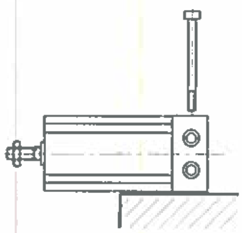


DB style - Head side mount

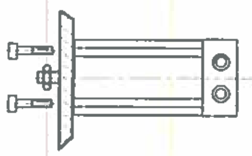
Mounting on the top or bottom surface



Mounting on the side surface

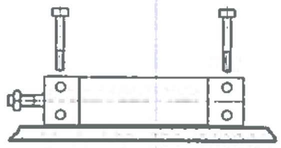


Mounting on the rod side

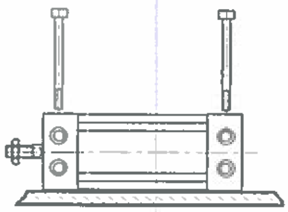


DC style - Heavy duty mount

Mounting on the top or bottom surface

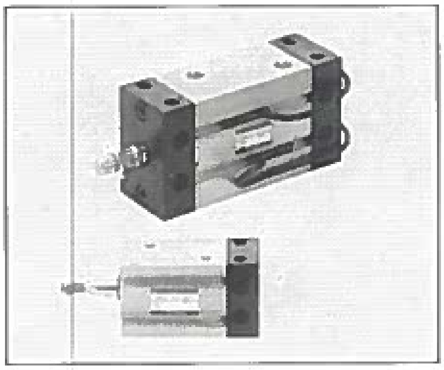


Mounting on the side surface



CKD Super mount cylinder

Double acting - SMD2 series
6, 10, 16, 20, 25, 32mm bore



1. General description and application benefits

Compact, lightweight double acting cylinders available in 3 mounting styles.

- Lightweight.
- Space saving.
- Magnetic piston (option).

2. Functional symbol

3. Preferred model selection

Non magnetic piston

Bore	Model code	Stroke 5	10	15	20	25	30	40	50
6mm	SMD2 - * * - 6 - Stroke	■	■	■	■	■	■		
10mm	SMD2 - * * - 10 - Stroke	■	■	■	■	■	■		
16mm	SMD2 - * * - 16 - Stroke	■	■	■	■	■	■		
20mm	SMD2 - * * - 20 - Stroke	■	■	■	■	■	■	■	■
25mm	SMD2 - * * - 25 - Stroke	■	■	■	■	■	■	■	■
32mm	SMD2 - * * - 32 - Stroke	■	■	■	■	■	■	■	■

Magnetic piston

Bore	Model code	Stroke 5	10	15	20	25	30	40	50
6mm	SMD2 - L - * * - 6 - Stroke	■	■	■	■	■	■		
10mm	SMD2 - L - * * - 10 - Stroke	■	■	■	■	■	■		
16mm	SMD2 - L - * * - 16 - Stroke	■	■	■	■	■	■		
20mm	SMD2 - L - * * - 20 - Stroke	■	■	■	■	■	■	■	■
25mm	SMD2 - L - * * - 25 - Stroke	■	■	■	■	■	■	■	■
32mm	SMD2 - L - * * - 32 - Stroke	■	■	■	■	■	■	■	■

*** * = Mounting style:- DA = Rod side mount, DB = Head side mount, DC = Heavy duty mount**

Non standard strokes available. Maximum stroke 60mm for 6 to 16mm bore units, 100mm for 20 to 32mm bore units.

Ordering example:- SMD2-L-DC-16-25 = 16mm bore double acting super mount cylinder x 25mm stroke, with magnetic piston and heavy duty mount.

4. Operating data (for basic model data see page SMD 1.1)

Piston rod thrust (N)

		Air pressure (bar) 1.0	1.5	2.0	3.0	4.0	5.0	6.0	7.0
6mm bore	OUT	-	4.2	5.7	8.5	11.0	14.0	17.0	20.0
	IN	-	3.2	4.2	6.4	8.5	11.0	13.0	15.0
10mm bore	OUT	7.9	12.0	16.0	24.0	31.0	39.0	47.0	55.0
	IN	6.6	9.9	13.0	20.0	26.0	33.0	40.0	46.0
16mm bore	OUT	20.0	30.0	40.0	60.0	80.0	101.0	121.0	141.0
	IN	17.0	26.0	35.0	52.0	69.0	86.0	104.0	121.0
20mm bore	OUT	31.0	47.0	63.0	94.0	126.0	157.0	188.0	220.0
	IN	26.0	40.0	53.0	79.0	106.0	132.0	158.0	185.0
25mm bore	OUT	49.0	74.0	98.0	147.0	196.0	245.0	295.0	344.0
	IN	41.0	62.0	82.0	124.0	165.0	206.0	247.0	289.0
32mm bore	OUT	80.0	121.0	161.0	241.0	322.0	402.0	483.0	563.0
	IN	69.0	104.0	138.0	207.0	276.0	346.0	415.0	484.0

Mass (kg)

Type	Model	Mass
Non magnetic type	SMD2-DA-6-Stroke	0.026kg + 0.003kg per 5mm stroke
	SMD2-DA-10-Stroke	0.037kg + 0.004kg per 5mm stroke
	SMD2-DA-16-Stroke	0.070kg + 0.006kg per 5mm stroke
	SMD2-DA-20-Stroke	0.137kg + 0.011kg per 5mm stroke
	SMD2-DA-25-Stroke	0.229kg + 0.017kg per 5mm stroke
	SMD2-DA-32-Stroke	0.445kg + 0.026kg per 5mm stroke
Magnetic type	SMD2-L-DA-6-Stroke	0.026kg + 0.003kg per 5mm stroke
	SMD2-L-DA-10-Stroke	0.037kg + 0.004kg per 5mm stroke
	SMD2-L-DA-16-Stroke	0.087kg + 0.006kg per 5mm stroke
	SMD2-L-DA-20-Stroke	0.166kg + 0.011kg per 5mm stroke
	SMD2-L-DA-25-Stroke	0.275kg + 0.017kg per 5mm stroke
	SMD2-L-DA-32-Stroke	0.515kg + 0.026kg per 5mm stroke

NOTE:- For DB mount reduce 0 stroke weight by 0.001kg for 6mm and 10mm units, 0.003kg for 16mm units, 0.006kg for 20mm units, 0.010kg for 25mm units and 0.018kg for 32mm units.

For DC mount increase 0 stroke weight by 0.008kg for 6mm units, 0.011kg for 10mm units, 0.027kg for 16mm units, 0.041kg for 20mm units, 0.062kg for 25mm units and 0.129kg for 32mm units

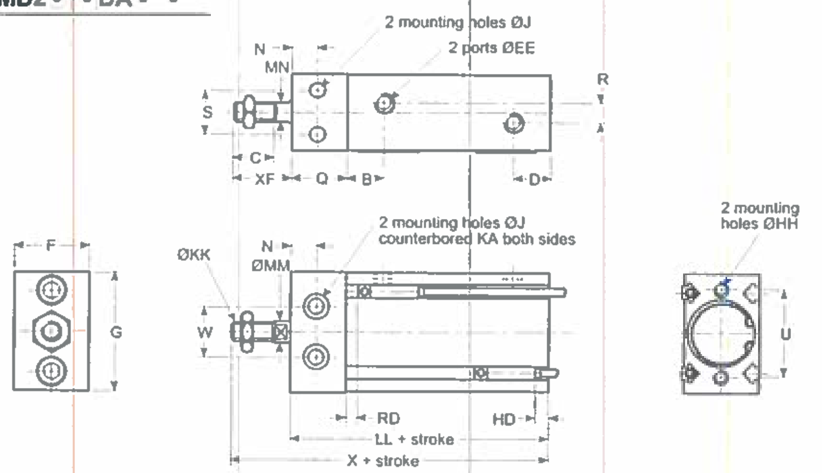
***Note:** Mass shown excludes magnetic sensors. Switch mass (with 3m lead)= 0.052kg.*

Service kits

6mm bore units	SMD2 - 6K	20mm bore units	SMD2 - 20K
10mm bore units	SMD2 - 10K	25mm bore unit	SMD2 - 25K
16mm bore units	SMD2 - 16K	32mm bore unit	SMD2 - 32K

5. Installation dimensions in mm

SMD2 - * - DA - * - *

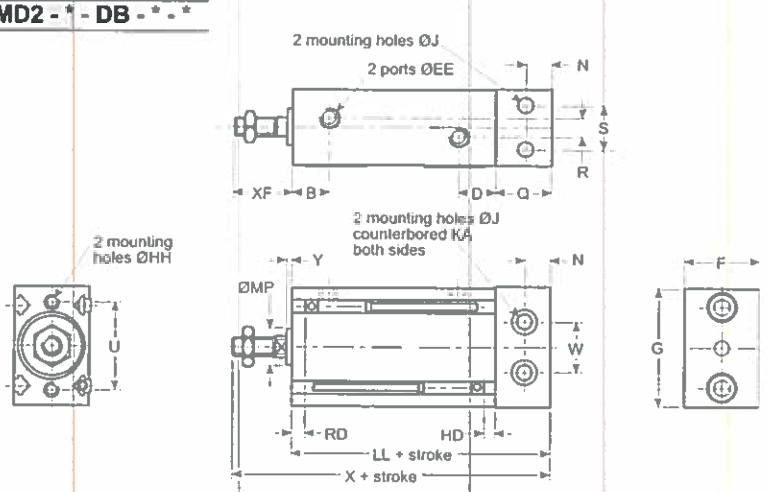


Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	38	51	13	38	51	13
10	41	57	16	41	57	16
16	40	56	16	50	66	16
20	46	65	19	56	75	19
25	50	73	23	60	83	23
32	62	89	27	72	99	27

Magnetic sensor positions

Bore	Reed Switch K0H HD	Reed Switch K0H RD	Proximity switch K3H HD	Proximity switch K3H RD
6	2.0	5.0	3.0	6.0
10	0.0	6.0	1.0	7.0
16	1.0	10.0	0.0	11.0
20	4.0	13.0	3.0	14.0
25	8.0	13.0	7.0	14.0
32	8.5	19.5	7.5	20.5

SMD2 - * - DB - * - *



*All other dimensions as for SMD2 - * - DA - * - * models above.*

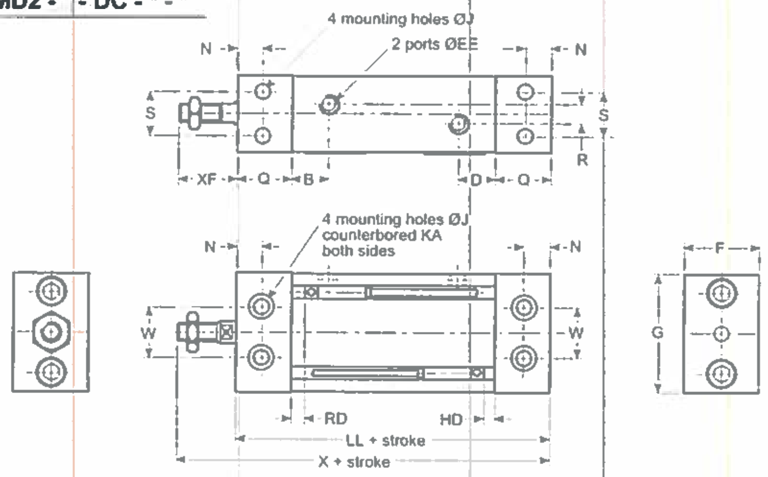
Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	38	52	14	38	52	14
10	41	58	17	41	58	17
16	40	56	16	50	66	16
20	46	65	19	56	75	19
25	50	73	23	60	83	23
32	62	89	27	72	99	27

Magnetic sensor positions

Bore	Reed Switch K0H HD	Reed Switch K0H RD	Proximity switch K3H HD	Proximity switch K3H RD
6	1.0	5.0	2.5	6.0
10	3.0	6.0	4.5	7.0
16	4.0	10.0	5.5	11.0
20	7.5	13.0	8.5	14.0
25	11.5	13.0	12.5	14.0
32	12.0	19.5	13.0	20.5

Note:
K0H and K3H style switches cannot be used on SMD2-L-DB-6-5, SMD2-L-DB-6-10, SMD2-L-DB-10-5, SMD2-L-DB-16-5 and SMD2-L-DB-20-5 cylinders. For these units fit the K0V and K3V style switches - for details contact Customer Services Department.

SMD2 - * - DC - * - *



*All other dimensions as for SMD2 - * - DA - * - * models above.*

Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	49	62	13	49	62	13
10	52	68	16	52	68	16
16	55	71	16	65	81	16
20	61	80	19	71	90	19
25	65	88	23	75	98	23
32	82	109	27	92	119	27

Magnetic sensor positions

Bore	Reed Switch K0H HD	Reed Switch K0H RD	Proximity switch K3H HD	Proximity switch K3H RD
6	1.0	5.0	2.5	6.0
10	3.0	6.0	4.5	7.0
16	4.0	10.0	5.5	11.0
20	7.5	13.0	8.5	14.0
25	11.5	13.0	12.5	14.0
32	12.0	19.5	13.0	20.5

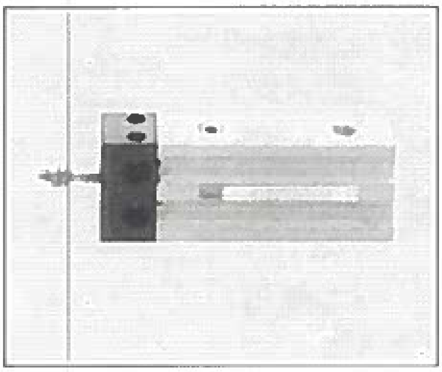
Note:
K0H and K3H style switches cannot be used on SMD2-L-DC-6-5, SMD2-L-DC-6-10, SMD2-L-DC-10-5, SMD2-L-DC-16-5 and SMD2-L-DC-20-5 cylinders. For these units fit the K0V and K3V style switches - for details contact Customer Services Department.

Bore	B	C	D	EE	F	G	HH	J	KA	KK	MM	MN	MP	N	Q	R	S	U	W	Y
6	11	7	10	M5	13.5	22.5	M2.5 x 5deep	3.4	5.9Ø x 4.8deep	M3	3	-	5	7	11	0	7	17	10	1
10	11	10	10	M5	15.5	24.5	M3 x 5deep	3.4	5.9Ø x 5deep	M4	4	-	6	7	11	0	9	18	11	1
16	10	11	10	M5	20.5	32.5	M4 x 6deep	4.5	7.5Ø x 6.5deep	M5	6	5	8	7	15	5	12	24	14	1
20	14	12	10	M5	26.5	40.5	M5 x 8deep	5.5	9.5Ø x 8deep	M6	8	6	12	9	15	12	16	30	16	1.5
25	14	15.5	10	M5	32.5	50.5	M5 x 8deep	5.5	9.5Ø x 9deep	M8	10	8	14	10	15	13	20	38	20	2
32	21	19.5	11	G1/8"	40.5	62.5	M6 x 9deep	6.6	10.5Ø x 11.5deep	M10 x 1.25	12	10	16	11	20	17	24	48	24	2

For dimensional details LL, X and XF see above right against relevant mounting option.

CKD Super mount cylinder

Single acting, spring return - SMD2-X series
6, 10, 16, 20, 25, 32mm bore



1. General description and application benefits

Compact, lightweight single acting spring return cylinders available in 3 mounting styles.

- Lightweight and space saving.
- Magnetic piston (option).

2. Functional symbol

3. Preferred model selection

Non magnetic piston

Bore	Model code	Stroke 5	Stroke 10	Stroke 15
6mm	SMD2 - X - * * - 6 - Stroke	■	■	■
10mm	SMD2 - X - * * - 10 - Stroke	■	■	■
16mm	SMD2 - X - * * - 16 - Stroke	■	■	■
20mm	SMD2 - X - * * - 20 - Stroke	■	■	■
25mm	SMD2 - X - * * - 25 - Stroke	■	■	■
32mm	SMD2 - X - * * - 32 - Stroke	■	■	■

Magnetic piston

Bore	Model code	Stroke 5	Stroke 10	Stroke 15
6mm	SMD2 - XL - * * - 6 - Stroke	■	■	■
10mm	SMD2 - XL - * * - 10 - Stroke	■	■	■
16mm	SMD2 - XL - * * - 16 - Stroke	■	■	■
20mm	SMD2 - XL - * * - 20 - Stroke	■	■	■
25mm	SMD2 - XL - * * - 25 - Stroke	■	■	■
32mm	SMD2 - XL - * * - 32 - Stroke	■	■	■

*** * = Mounting style:- DA = Rod side mount, DB = Head side mount,DC = Heavy duty mount**

Ordering example:- SMD2-XL-DA-6-10 = 6mm bore single acting spring return super mount cylinder x 10mm stroke, with magnetic piston and rod side mount.

4. Operating data (for basic model data see page SMD 1.1)

Piston rod thrust - OUT (N)

Air pressure (bar)	1.5	2.0	3.0	4.0	5.0	6.0	7.0
6mm bore	-	-	4.0	7.0	10.0	13.0	16.0
10mm bore	-	8.0	16.0	24.0	32.0	40.0	48.0
16mm bore	-	25.0	45.0	65.0	85.0	105.0	125.0
20mm bore	-	47.0	78.0	110.0	141.0	172.0	204.0
25mm bore	-	50.0	99.0	148.0	197.0	246.0	295.0
32mm bore	80.0	121.0	201.0	281.0	362.0	442.0	523.0

Piston rod thrust - RETURN (N)

Stroke (mm)	5	10	15
6mm bore	4.0	3.0	2.0
10mm bore	6.0	5.0	4.0
16mm bore	13.0	10.0	8.0
20mm bore	14.0	12.0	10.0
25mm bore	40.0	32.0	25.0
32mm bore	35.0	30.0	25.0

Mass (kg)

Type	Model	Mass
Non magnetic type	SMD2-X-DA-6-Stroke	0.030kg + 0.003kg per 5mm stroke
	SMD2-X-DA-10-Stroke	0.042kg + 0.004kg per 5mm stroke
	SMD2-X-DA-16-Stroke	0.079kg + 0.006kg per 5mm stroke
	SMD2-X-DA-20-Stroke	0.153kg + 0.011kg per 5mm stroke
	SMD2-X-DA-25-Stroke	0.256kg + 0.017kg per 5mm stroke
	SMD2-X-DA-32-Stroke	0.486kg + 0.026kg per 5mm stroke
Magnetic type	SMD2-XL-DA-6-Stroke	0.030kg + 0.003kg per 5mm stroke
	SMD2-XL-DA-10-Stroke	0.042kg + 0.004kg per 5mm stroke
	SMD2-XL-DA-16-Stroke	0.096kg + 0.006kg per 5mm stroke
	SMD2-XL-DA-20-Stroke	0.182kg + 0.011kg per 5mm stroke
	SMD2-XL-DA-25-Stroke	0.302kg + 0.017kg per 5mm stroke
	SMD2-XL-DA-32-Stroke	0.556kg + 0.026kg per 5mm stroke

NOTE:- For DB mount reduce 0 stroke weight by 0.001kg for 6mm and 10mm units, 0.002kg for 16mm units, 0.006kg for 20mm units, 0.009kg for 25mm units and 0.018kg for 32mm units.
For DC mount increase 0 stroke weight by 0.008kg for 6mm units, 0.011kg for 10mm units, 0.027kg for 16mm units, 0.041kg for 20mm units, 0.062kg for 25mm units and 0.129kg for 32mm units

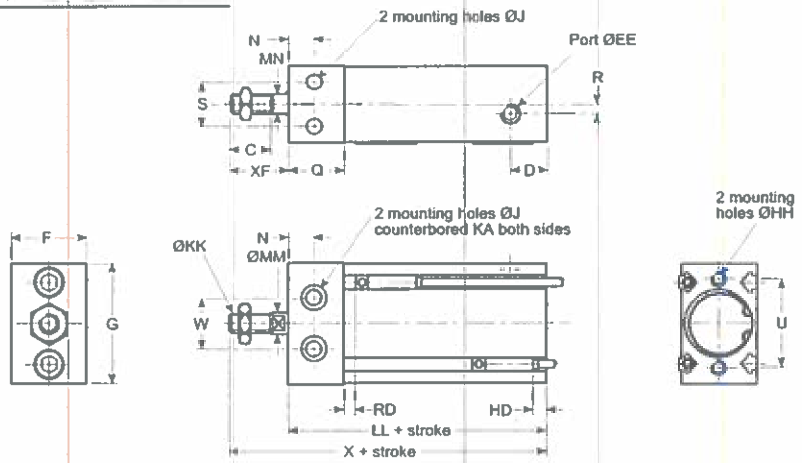
Note: Mass shown excludes magnetic sensors. Switch mass (with 3m lead)= 0.052kg.

Service kits

Units	Kit	Units	Kit
6mm bore units	SMD2 - X - 6K	20mm bore units	SMD2 - X - 20K
10mm bore units	SMD2 - X - 10K	25mm bore unit	SMD2 - X - 25K
16mm bore units	SMD2 - X - 16K	32mm bore unit	SMD2 - X - 32K

5. Installation dimensions in mm

SMD2 - X * - DA - * - *

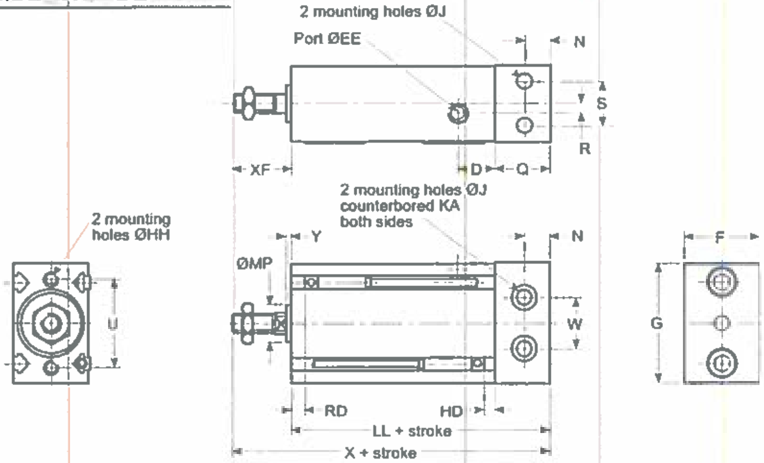


Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	43	56	13	43	56	13
10	46	62	16	46	62	16
16	45	61	16	55	71	16
20	51	70	19	61	80	19
25	55	78	23	65	88	23
32	67	94	27	77	104	27

Magnetic sensor positions

Bore	Reed Switch K0H HD	Reed Switch K0H RD	Proximity switch K3H HD	Proximity switch K3H RD
6	2.0	10.0	3.0	11.0
10	0.0	11.0	1.0	12.0
16	1.0	15.0	0.0	16.0
20	4.0	18.0	3.0	19.0
25	8.0	18.0	7.0	19.0
32	8.5	24.5	7.5	25.5

SMD2 - X * - DB - * - *



*All other dimensions as for SMD2 - X * - DA - * - * models above.*

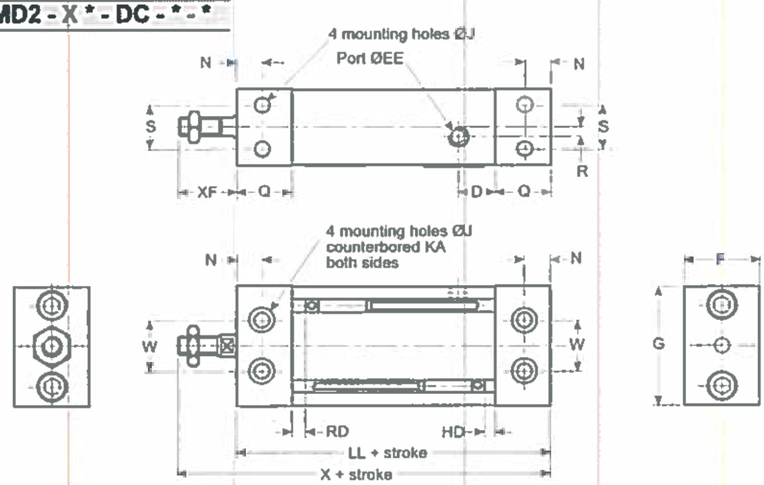
Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	43	57	14	43	57	14
10	46	63	17	46	63	17
16	45	61	16	55	71	16
20	51	70	19	61	80	19
25	55	78	23	65	88	23
32	67	94	27	77	104	27

Magnetic sensor positions

Bore	Reed Switch K0H HD	Reed Switch K0H RD	Proximity switch K3H HD	Proximity switch K3H RD
6	1.0	10.0	2.5	11.0
10	3.0	11.0	4.5	12.0
16	4.0	15.0	5.5	16.0
20	7.5	18.0	8.5	19.0
25	11.5	18.0	12.5	19.0
32	12.0	24.5	13.0	25.5

Note:
K0H and K3H style switches cannot be used on SMD2-XL-DB-6-5, SMD2-XL-DB-6-10, SMD2-XL-DB-10-5, SMD2-XL-DB-16-5 and SMD2-XL-DB-20-5 cylinders.
For these units fit the K0V and K3V style switches - for details contact Customer Services Department

SMD2 - X * - DC - * - *



*All other dimensions as for SMD2 - X * - DA - * - * models above.*

Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	54	67	13	54	67	13
10	57	73	16	57	73	16
16	60	76	16	70	86	16
20	66	85	19	76	95	19
25	70	93	23	80	103	23
32	87	114	27	97	124	27

Magnetic sensor positions

Bore	Reed Switch K0H HD	Reed Switch K0H RD	Proximity switch K3H HD	Proximity switch K3H RD
6	1.0	10.0	2.5	11.0
10	3.0	11.0	4.5	12.0
16	4.0	15.0	5.5	16.0
20	7.5	18.0	8.5	19.0
25	11.5	18.0	12.5	19.0
32	12.0	24.5	13.0	25.5

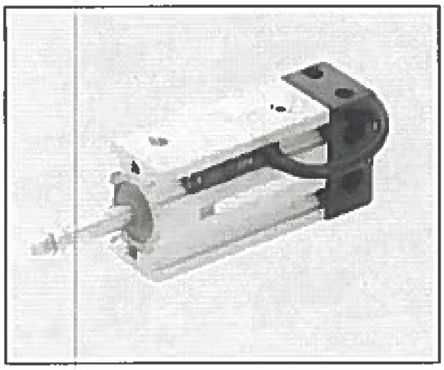
Note:
K0H and K3H style switches cannot be used on SMD2-XL-DC-6-5, SMD2-XL-DC-6-10, SMD2-XL-DC-10-5, SMD2-XL-DC-16-5 and SMD2-XL-DC-20-5 cylinders.
For these units fit the K0V and K3V style switches - for details contact Customer Services Department.

Bore	C	D	EE	F	G	HH	J	KA	KK	MM	MN	MP	N	Q	R	S	U	W	Y
6	7	10	M5	13.5	22.5	M2.5 x 5deep	3.4	5.9Ø x 4.8deep	M3	3	-	5	7	11	0	7	17	10	1
10	10	10	M5	15.5	24.5	M3 x 5deep	3.4	5.9Ø x 5deep	M4	4	-	6	7	11	0	9	18	11	1
16	11	10	M5	20.5	32.5	M4 x 6deep	4.5	7.5Ø x 6.5deep	M5	6	5	8	7	15	2.5	12	24	14	1
20	12	10	M5	26.5	40.5	M5 x 8deep	5.5	9.5Ø x 8deep	M6	8	6	12	9	15	6	16	30	16	1.5
25	15.5	10	M5	32.5	50.5	M5 x 8deep	5.5	9.5Ø x 9deep	M8	10	8	14	10	15	6.5	20	38	20	2
32	19.5	11	G1/8"	40.5	62.5	M6 x 9deep	6.6	10.5Ø x 11.5deep	M10 x 1.25	12	10	16	11	20	8.5	24	48	24	2

For dimensional details LL, X and XF see above right against relevant mounting option.

CKD Super mount cylinder

Single acting, spring extend - SMD2-Y series
6, 10, 16, 20, 25, 32mm bore



1. General description and application benefits

Compact, lightweight single acting spring extend cylinders available in 3 mounting styles.

- Lightweight and space saving.
- Magnetic piston (option).

2. Functional symbol

3. Preferred model selection

Non magnetic piston

Bore	Model code	Stroke 5	10	15
6mm	SMD2 - Y - * * - 6 - Stroke	■	■	■
10mm	SMD2 - Y - * * - 10 - Stroke	■	■	■
16mm	SMD2 - Y - * * - 16 - Stroke	■	■	■
20mm	SMD2 - Y - * * - 20 - Stroke	■	■	■
25mm	SMD2 - Y - * * - 25 - Stroke	■	■	■
32mm	SMD2 - Y - * * - 32 - Stroke	■	■	■

Magnetic piston

Bore	Model code	Stroke 5	10	15
6mm	SMD2 - YL - * * - 6 - Stroke	■	■	■
10mm	SMD2 - YL - * * - 10 - Stroke	■	■	■
16mm	SMD2 - YL - * * - 16 - Stroke	■	■	■
20mm	SMD2 - YL - * * - 20 - Stroke	■	■	■
25mm	SMD2 - YL - * * - 25 - Stroke	■	■	■
32mm	SMD2 - YL - * * - 32 - Stroke	■	■	■

*** * = Mounting style:- DA = Rod side mount, DB = Head side mount, DC = Heavy duty mount**

Ordering example:- SMD2-Y-DB-10-15 = 10mm bore single acting spring extend super mount cylinder x 15mm stroke, with head side mount

4. Operating data (for basic model data see page SMD 1.1)

Piston rod thrust - IN (N)

Air pressure (bar)	1.5	2.0	3.0	4.0	5.0	6.0	7.0
6mm bore	-	-	3.0	4.0	7.0	9.0	11.0
10mm bore	-	6.0	12.0	19.0	26.0	32.0	39.0
16mm bore	-	19.0	36.0	54.0	71.0	88.0	105.0
20mm bore	-	37.0	63.0	89.0	116.0	142.0	169.0
25mm bore	-	34.0	75.0	117.0	158.0	199.0	240.0
32mm bore	63.0	98.0	167.0	236.0	305.0	374.0	444.0

Note: Air pressure for 6mm bore cylinders is 3.5 bar

Piston rod thrust - EXTEND (N)

Stroke (mm)	5	10	15
6mm bore	4.0	3.0	2.0
10mm bore	6.0	5.0	4.0
16mm bore	13.0	10.0	8.0
20mm bore	14.0	12.0	10.0
25mm bore	40.0	32.0	25.0
32mm bore	35.0	30.0	25.0

Mass (kg)

Type	Model	Mass
Non magnetic type	SMD2-Y-DA-6-Stroke	0.030kg + 0.003kg per 5mm stroke
	SMD2-Y-DA-10-Stroke	0.042kg + 0.004kg per 5mm stroke
	SMD2-Y-DA-16-Stroke	0.079kg + 0.006kg per 5mm stroke
	SMD2-Y-DA-20-Stroke	0.153kg + 0.011kg per 5mm stroke
	SMD2-Y-DA-25-Stroke	0.256kg + 0.017kg per 5mm stroke
	SMD2-Y-DA-32-Stroke	0.486kg + 0.026kg per 5mm stroke
Magnetic type	SMD2-YL-DA-6-Stroke	0.030kg + 0.003kg per 5mm stroke
	SMD2-YL-DA-10-Stroke	0.042kg + 0.004kg per 5mm stroke
	SMD2-YL-DA-16-Stroke	0.096kg + 0.006kg per 5mm stroke
	SMD2-YL-DA-20-Stroke	0.182kg + 0.011kg per 5mm stroke
	SMD2-YL-DA-25-Stroke	0.302kg + 0.017kg per 5mm stroke
	SMD2-YL-DA-32-Stroke	0.556kg + 0.026kg per 5mm stroke

NOTE:- *For DB mount reduce 0 stroke weight by 0.001kg for 6mm and 10mm units, 0.002kg for 16mm units, 0.006kg for 20mm units, 0.009kg for 25mm units and 0.018kg for 32mm units.*
For DC mount increase 0 stroke weight by 0.008kg for 6mm units, 0.011kg for 10mm units, 0.027kg for 16mm units, 0.041kg for 20mm units, 0.062kg for 25mm units and 0.129kg for 32mm units

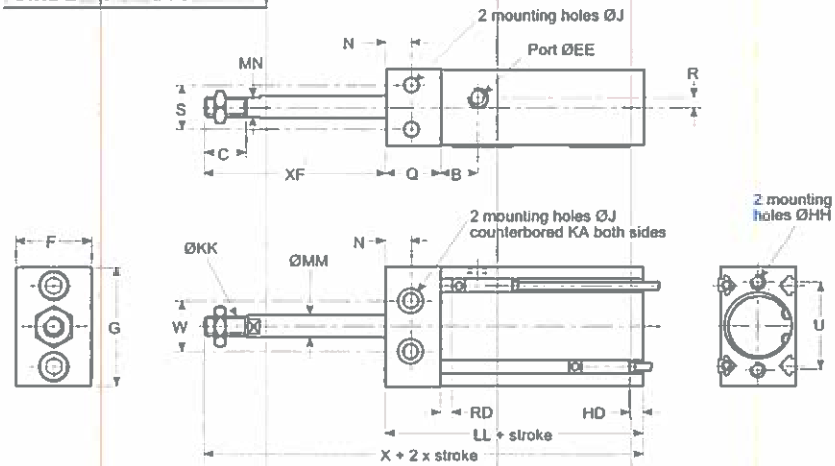
Note: Mass shown excludes magnetic sensors. Switch mass (with 3m lead)= 0.052kg

Service kits

Bore	Kit	Bore	Kit
6mm bore units	SMD2 - Y - 6K	20mm bore units	SMD2 - Y - 20K
10mm bore units	SMD2 - Y - 10K	25mm bore unit	SMD2 - Y - 25K
16mm bore units	SMD2 - Y - 16K	32mm bore unit	SMD2 - Y - 32K

5. Installation dimensions in mm

SMD2 - Y * - DA - * - *

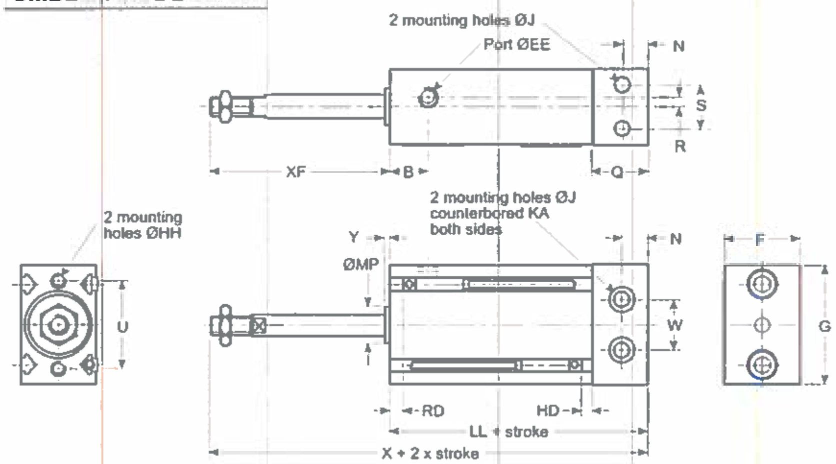


Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	43	56	13	43	56	13
10	46	62	16	46	62	16
16	45	61	16	55	71	16
20	51	70	19	61	80	19
25	55	78	23	65	88	23
32	67	94	27	77	104	27

Magnetic sensor positions

Bore	Reed Switch K0H HD	RD	Proximity switch K3H HD	RD
6	3.0	5.0	2.0	6.0
10	5.0	6.0	4.0	7.0
16	6.0	10.0	5.0	11.0
20	9.0	13.0	8.0	14.0
25	13.0	13.0	12.0	14.0
32	13.5	19.5	12.5	20.5

SMD2 - Y * - DB - * - *



Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	43	57	14	43	57	14
10	46	63	17	46	63	17
16	45	61	16	55	71	16
20	51	70	19	61	80	19
25	55	78	23	65	88	23
32	67	94	27	77	104	27

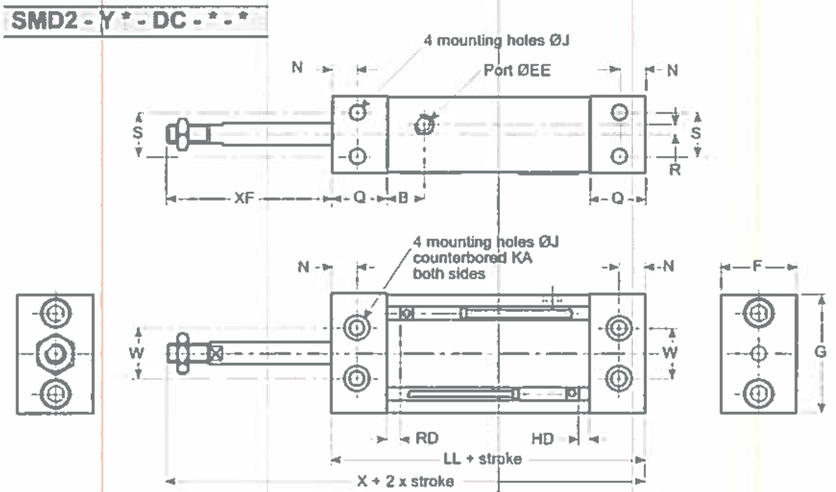
Magnetic sensor positions

Bore	Reed Switch K0H HD	RD	Proximity switch K3H HD	RD
6	6.0	5.0	7.5	6.0
10	8.0	6.0	9.5	7.0
16	9.0	10.0	10.5	11.0
20	2.5	13.0	13.5	14.0
25	16.5	13.0	17.5	14.0
32	17.0	19.5	18.0	20.5

Note:
K0H and K3H style switches cannot be used on SMD2-YL-DB-6-5, SMD2-YL-DB-10-5 cylinders. For these units fit the K0V and K3V style switches - for details contact Customer Services Department.

*All other dimensions as for SMD2 - Y * - DA - * - * models above.*

SMD2 - Y * - DC - * - *



Bore	Non magnetic LL	X	XF	Magnetic LL	X	XF
6	54	67	13	54	67	13
10	57	73	16	57	73	16
16	60	76	16	70	86	16
20	66	85	19	76	95	19
25	70	93	23	80	103	23
32	87	114	27	97	124	27

Magnetic sensor positions

Bore	Reed Switch K0H HD	RD	Proximity switch K3H HD	RD
6	6.0	5.0	7.5	6.0
10	8.0	6.0	9.5	7.0
16	9.0	10.0	10.5	11.0
20	2.5	13.0	13.5	14.0
25	16.5	13.0	17.5	14.0
32	17.0	19.5	18.0	20.5

Note:
K0H and K3H style switches cannot be used on SMD2-YL-DB-6-5, SMD2-YL-DB-10-5 cylinders. For these units fit the K0V and K3V style switches - for details contact Customer Services Department.

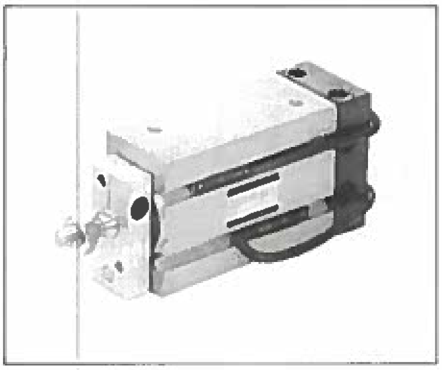
*All other dimensions as for SMD2 - Y * - DA - * - * models above.*

Bore	B	C	EE	F	G	HH	J	KA	KK	MM	MN	MP	N	Q	R	S	U	W	Y
6	11	7	M5	13.5	22.5	M2.5 x 5deep	3.4	5.9Ø x 4.8deep	M3	3	-	5	7	11	0	7	17	10	1
10	11	10	M5	15.5	24.5	M3 x 5deep	3.4	5.9Ø x 5deep	M4	4	-	6	7	11	0	9	18	11	1
16	10	11	M5	20.5	32.5	M4 x 6deep	4.5	7.5Ø x 6.5deep	M5	6	5	8	7	15	2.5	12	24	14	1
20	14	12	M5	26.5	40.5	M5 x 8deep	5.5	9.5Ø x 8deep	M6	8	6	12	9	15	6	16	30	16	1.5
25	14	15.5	M5	32.5	50.5	M5 x 8deep	5.5	9.5Ø x 9deep	M8	10	8	14	10	15	6.5	20	38	20	2
32	21	19.5	G1/8"	40.5	62.5	M6 x 9deep	6.6	10.5Ø x 11.5deep	M10 x 1.25	12	10	16	11	20	8.5	24	48	24	2

For dimensional details LL, X and XF see above right against relevant mounting option.

CKD Super mount cylinder

Double acting, non rotating - SMD2-M series
6, 10, 16, 20, 25, 32mm bore



1. General description and application benefits

Compact, lightweight double acting non rotating cylinders available in 3 mounting styles.

- Lightweight and space saving.
- Magnetic piston (option).

2. Functional symbol

3. Preferred model selection

Non magnetic piston

Bore	Model code	Stroke 5	10	15	20	25	30	40	50
6mm	SMD2 - M - 6 - Stroke	■	■	■	■	■	■		
10mm	SMD2 - M - 10 - Stroke	■	■	■	■	■	■		
16mm	SMD2 - M - 16 - Stroke	■	■	■	■	■	■		
20mm	SMD2 - M - 20 - Stroke	■	■	■	■	■	■	■	■
25mm	SMD2 - M - 25 - Stroke	■	■	■	■	■	■	■	■
32mm	SMD2 - M - 32 - Stroke	■	■	■	■	■	■	■	■

Magnetic piston

Bore	Model code	Stroke 5	10	15	20	25	30	40	50
6mm	SMD2 - ML - 6 - Stroke	■	■	■	■	■	■		
10mm	SMD2 - ML - 10 - Stroke	■	■	■	■	■	■		
16mm	SMD2 - ML - 16 - Stroke	■	■	■	■	■	■		
20mm	SMD2 - ML - 20 - Stroke	■	■	■	■	■	■	■	■
25mm	SMD2 - ML - 25 - Stroke	■	■	■	■	■	■	■	■
32mm	SMD2 - ML - 32 - Stroke	■	■	■	■	■	■	■	■

NOTE: Mounting style type DB (Head side mount) supplied as standard - other options not available for these models.

Ordering example:- SMD2-ML-32-50 = 32mm bore double acting non rotating super mount cylinder x 50mm stroke, with magnetic piston and head side mount.

4. Operating data (for basic model data see page SMD 1.1)

Piston rod thrust (N)

Bore		Air pressure (bar) 1.0	1.5	2.0	3.0	4.0	5.0	6.0	7.0
6mm bore	OUT	-	4.2	5.7	8.5	11.0	14.0	17.0	20.0
	IN	-	3.2	4.2	6.4	8.5	11.0	13.0	15.0
10mm bore	OUT	7.9	12.0	16.0	24.0	31.0	39.0	47.0	55.0
	IN	6.6	9.9	13.0	20.0	26.0	33.0	40.0	46.0
16mm bore	OUT	20.0	30.0	40.0	60.0	80.0	101.0	121.0	141.0
	IN	17.0	26.0	35.0	52.0	69.0	86.0	104.0	121.0
20mm bore	OUT	31.0	47.0	63.0	94.0	126.0	157.0	188.0	220.0
	IN	26.0	40.0	53.0	79.0	106.0	132.0	158.0	185.0
25mm bore	OUT	49.0	74.0	98.0	147.0	196.0	245.0	295.0	344.0
	IN	41.0	62.0	82.0	124.0	165.0	206.0	247.0	289.0
32mm bore	OUT	80.0	121.0	161.0	241.0	322.0	402.0	483.0	563.0
	IN	69.0	104.0	138.0	207.0	276.0	346.0	415.0	484.0

Mass (kg)

Type	Model	Mass
Non magnetic type	SMD2-M-6-Stroke	0.030kg + 0.003kg per 5mm stroke
	SMD2-M-10-Stroke	0.043kg + 0.004kg per 5mm stroke
	SMD2-M-16-Stroke	0.079kg + 0.007kg per 5mm stroke
	SMD2-M-20-Stroke	0.146kg + 0.012kg per 5mm stroke
	SMD2-M-25-Stroke	0.251kg + 0.018kg per 5mm stroke
	SMD2-M-32-Stroke	0.486kg + 0.026kg per 5mm stroke
Magnetic type	SMD2-ML-6-Stroke	0.026kg + 0.003kg per 5mm stroke
	SMD2-ML-10-Stroke	0.037kg + 0.004kg per 5mm stroke
	SMD2-ML-16-Stroke	0.087kg + 0.006kg per 5mm stroke
	SMD2-ML-20-Stroke	0.166kg + 0.011kg per 5mm stroke
	SMD2-ML-25-Stroke	0.275kg + 0.017kg per 5mm stroke
	SMD2-ML-32-Stroke	0.515kg + 0.026kg per 5mm stroke

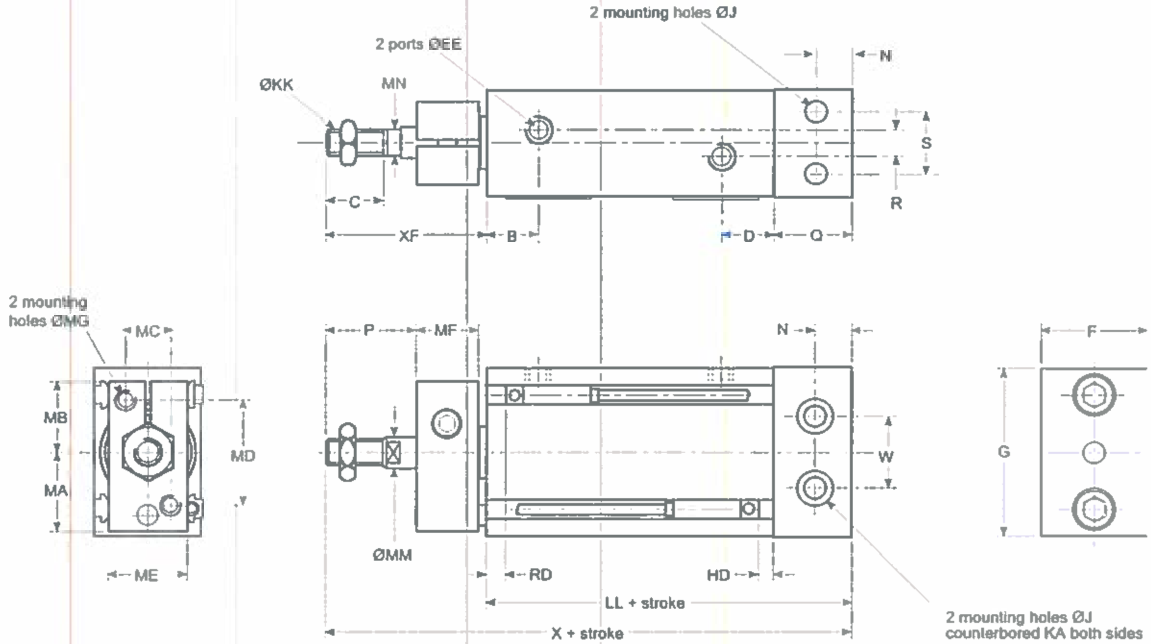
***Note:** Mass shown excludes magnetic sensors. Switch mass (with 3m lead)= 0.052kg.*

Service kits

Unit	Kit	Unit	Kit
6mm bore units	SMD2 - 6K	20mm bore units	SMD2 - 20K
10mm bore units	SMD2 - 10K	25mm bore unit	SMD2 - 25K
16mm bore units	SMD2 - 16K	32mm bore unit	SMD2 - 32K

5. Installation dimensions in mm

SMD2 - M * - * - *



Bore	B	C	D	EE	F	G	J	KA	KK	MM	MN	N	Q	R	S	W
6	11	7	10	M5	13.5	22.5	3.4	5.9Ø x 4.8deep	M3	3	-	7	11	0	7	10
10	11	10	10	M5	15.5	24.5	3.4	5.9Ø x 5deep	M4	4	-	7	11	0	9	11
16	10	11	10	M5	20.5	32.5	4.5	7.5Ø x 6.5deep	M5	6	5	7	15	5	12	14
20	14	12	10	M5	26.5	40.5	5.5	9.5Ø x 8deep	M6	8	6	9	15	12	16	16
25	14	15.5	10	M5	32.5	50.5	5.5	9.5Ø x 9deep	M8	10	8	10	15	13	20	20
32	21	19.5	11	G1/8"	40.5	62.5	6.6	10.5Ø x 11.5deep	M10 x 1.25	12	10	11	20	17	24	24

Bore	MA	MB	MC	MD	ME	MF	MG	P
6	10.5	9.5	6	14	11	8	M3	10
10	11.5	10.5	7	15	12	8	M3	13
16	15.5	14.5	6	18	13	8	M4	17
20	19.5	13.5	8	20	15	8	M4	20
25	24.5	19	10	28	20	10	M5	22
32	30.5	21	12	32	25	12	M5	29

	Non magnetic			Magnetic		
Bore	LL	X	XF	LL	X	XF
6	38	57	19	38	57	19
10	41	63	22	41	63	22
16	40	66	26	50	76	26
20	46	75	29	56	85	29
25	50	83	33	60	93	33
32	62	104	42	72	114	42

Magnetic sensor positions

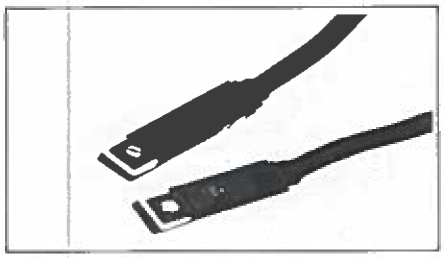
Bore	Reed Switch K0H		Proximity switch K3H	
	HD	RD	HD	RD
6	1.0	5.0	2.5	6.0
10	3.0	6.0	4.5	7.0
16	4.0	10.0	5.5	11.0
20	7.5	13.0	8.5	14.0
25	11.5	13.0	12.5	14.0
32	12.0	19.5	13.0	20.5

Note:
K0H and K3H style switches cannot be used on SMD2-ML-6-5, SMD2-ML-6-10, SMD2-ML-10-5, SMD2-ML-16-5 and SMD2-ML-20-5 cylinders.
For these units fit the K0V and K3V style switches - for details contact Customer Services Department.

VICKERS

CKD Super mount cylinders

Magnetic sensors - Reed switch Type K0H and Proximity switch Type K3H
6, 10, 16, 20, 20, 25, 32mm



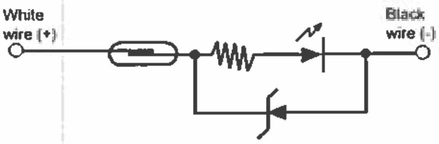
1. General description and application benefits

Continuously rated reed and proximity switches with LED indicator and flying lead.
Programmable controller relay operation.

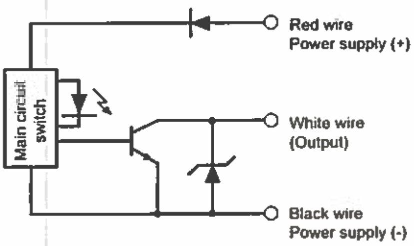
- Switches fit within cylinder body envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagrams of switches

Reed switch K0H*



Proximity switch K3H*



3. Preferred model selection

Reed switch

Model code	Description
K0H3	Axial lead wire reed switch with 3metre flying lead (Standard)
K0H5	Axial lead wire reed switch with 5 metre flying lead (Optional)

Proximity switch

Model code	Description
K3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
K3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

4. Operating data

Ambient operating temperature range	-10^{0}C to + 60^{0}C (14 F to + 140^{0} F)
Load voltage/current	K0H* - 12, 24vDC/ 5 to 50mA 110vAC/ 7 to 20mA K3H* - 30vDC or less/100mA or less
Power consumption	K3H* - 24vDC (ON) 10mA or less
Leakage current	K3H* - 10 μA or less
Maximum impulse	K0H* - 30G K3H* - 100G
Protection	IEC standard IP67
Lead wire	K0H* - Oil proof 2 core vinyl cabtyre cord $0.2mm^2$ K3H* - Oil proof 3 core vinyl cabtyre cord $0.2mm^2$
Insulation resistance	More than $20M\Omega$ at 500v DC megger
LED indication	Red (ON)

5. Installation requirements

Reed switch K0H*

Magnetic environment
Avoid using at places with strong magnetic field and high current (large magnet, spot welder, etc.) in the surroundings. When making proximity connection of cylinders with switches in parallel, the magnetic substance moving at the vicinity of the cylinder may cause matual interference, affecting the detecting accuracy.

Lead wire connection
Be sure to connect the lead wire of the switch to a load in series, instead of connecting it directly to the power source.

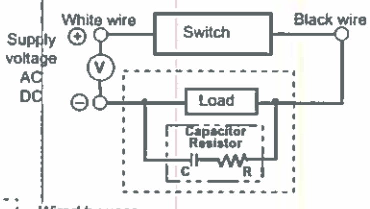
[A] For DC, white wire is the positive (+) side and the black wire the negative (-) side.
If connected inverse, the switch activates, but the lamp fails to light.

[B] To connect the lead wire to an AC relay or input terminal of the programmable controller , the lamp of the switch may not light if each circuit is half-wave rectification. In such cases reverse the polarity of the connection, then the lamp will light.

Contact capacity
Avoid using the load with the capacity exceeding the maximum contact capacity of the switch. When the current is below the rated current level, the switch lamp may fail to light.

Contact protection
When using for the inductive load (such as relay, etc.), be sure to install the contact protection circuits shown below.

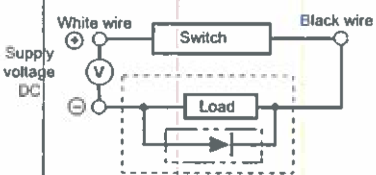
- When using capacitor and resistance



Wired by user

Protection circuit (spark quenching circuit)
Recommended value capacitor C 0.033 - 0.1μF
Resistor R 1 - 3KΩ
By Okaya Denki XEBIKI or equivalent

- When using diode

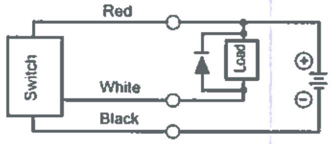


Wired by user

Protection
General rectifier diode
By Hitachi V06 or equivalent

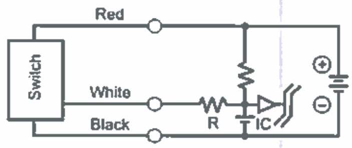
Proximity switch K3H*

Output circuit protection
When an inductive load (relay or solenoid valve) is connected, be sure to install the protection circuit shown below in order to protect from the surge voltage generated when the switch is turned OFF.



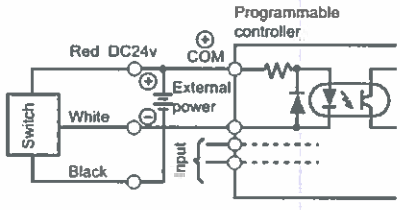
Example of surge absorbing element (diode) jointly used as the inductive load. Use Hitachi diode V06 or equivalent

When a capacitive load (condenser) is connected, be sure to install the protection circuit shown below in order to protect from the inrush current generated when the switch is turned ON.

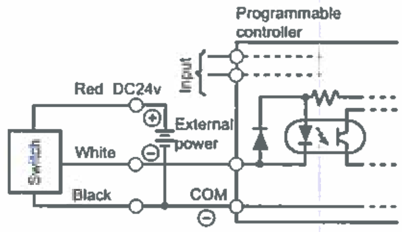


Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0.10 = R (Ω)

Connection to programmable controller (sequencer)
The connecting method differs according to the type of programmable controller.
Make connections as shown below.

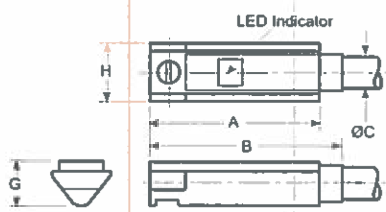


Example of switch K3H connection to source input (external power) type.*



Example of switch K3H connection to source input (built - in power) type.*
The switch cannot be connected to the sink input sequencer.

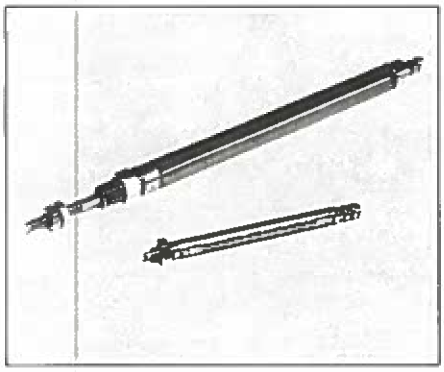
6. Installation dimensions in mm



Model code	A	B	C	G	H
K0H*	24	26.5	3.4	4.5	7.0
K3H*	24	26.5	3.4	4.5	7.0

Pencil cylinders

Single acting - SCPS series
2.5, 4mm bore



3. Preferred model selection

Bore	Model code	Stroke 5	10	15	20
2.5mm	SCPS - 00 - 2.5 - Stroke	■	■		
4mm	SCPS - 00 - 4 - Stroke	■	■	■	■

Ordering example:-

SCPS - 00 - 4 - 15 = 4mm bore single acting cylinder, 15mm stroke.

1. General description and application benefits

Compact, lightweight single acting extending type pencil cylinders of 2.5mm and 4mm bore size.

- Lightweight.
- Ease of installation.
- Lube free.
- Suitable for precision manufacturing industries.

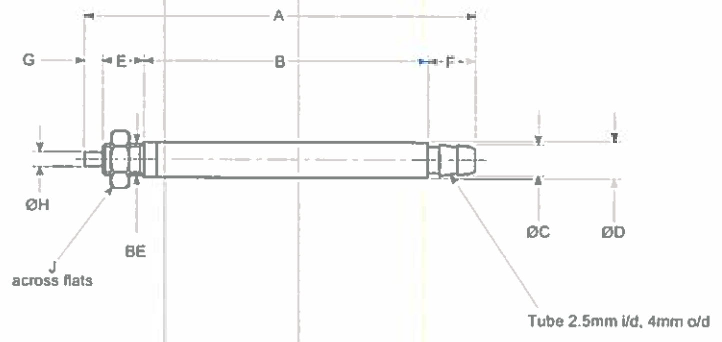
2. Functional symbol

4. Operating data

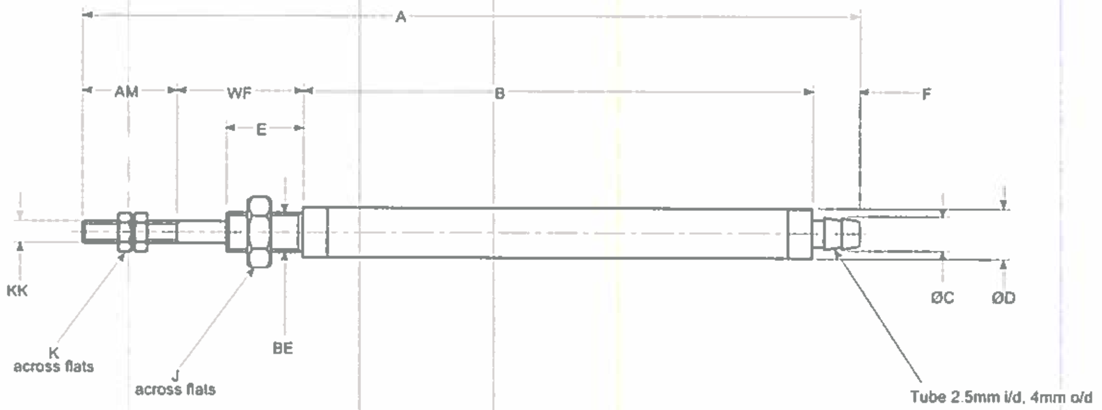
Operating pressure	3.5 - 10 bar (50 - 145 psig)
Ambient operating temperature range	-10° C to + 60° C (14° F to + 140° F)
Type of connection	Barb tube connection 2.5mm i/d, 4mm o/d tube
Materials of construction	Barrel - Stainless steel Piston rod - Stainless steel Piston - Aluminium alloy End covers -Stainless steel Seals - Nitrile rubber
Operating medium	Compressed air, filtered and lubricated or non lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Installation dimensions	See overleaf
Mass	SCPS - 00 - 2.5 - 5 1.6g SCPS - 00 - 2.5 -10 1.7g SCPS - 00 - 4 - 5 7.0g SCPS - 00 - 4 - 10 8.0g SCPS - 00 - 4 - 15 9.0g SCPS - 00 - 4 - 20 10.0g
Service kits	Fit new unit

4. Installation dimensions in mm

2.5mm bore (SCPS - 00 - 2.5 - **)



4mm bore (SCPS - 00 - 4 - **)



Bore	Stroke	A	AM	B	BE	C	D	E	F	G	H	J	K	KK	WF
2.5	5	33		24	M2.5x0.45	2.6	3	3.5	4	1.5	1	4			
2.5	10	38		29	M2.5x0.45	2.6	3	3.5	4	1.5	1	4			
4	5	60.5	10	32.5	M4x0.7	2.6	5	8	5			4	5	M2x0.4	13
4	10	65.5	10	37.5	M4x0.7	2.6	5	8	5			4	5	M2x0.4	13
4	15	81.5	10	53.0	M4x0.7	2.6	5	8	5			4	5	M2x0.4	13
4	20	86.6	10	58.0	M4x0.7	2.6	5	8	5			4	5	M2x0.4	13

Note: *2.5mm bore cylinders - 1 off cylinder neck nut supplied as standard.*
4mm bore cylinders - 1 off cylinder neck nut and 2 off piston rod nuts supplied as standard.

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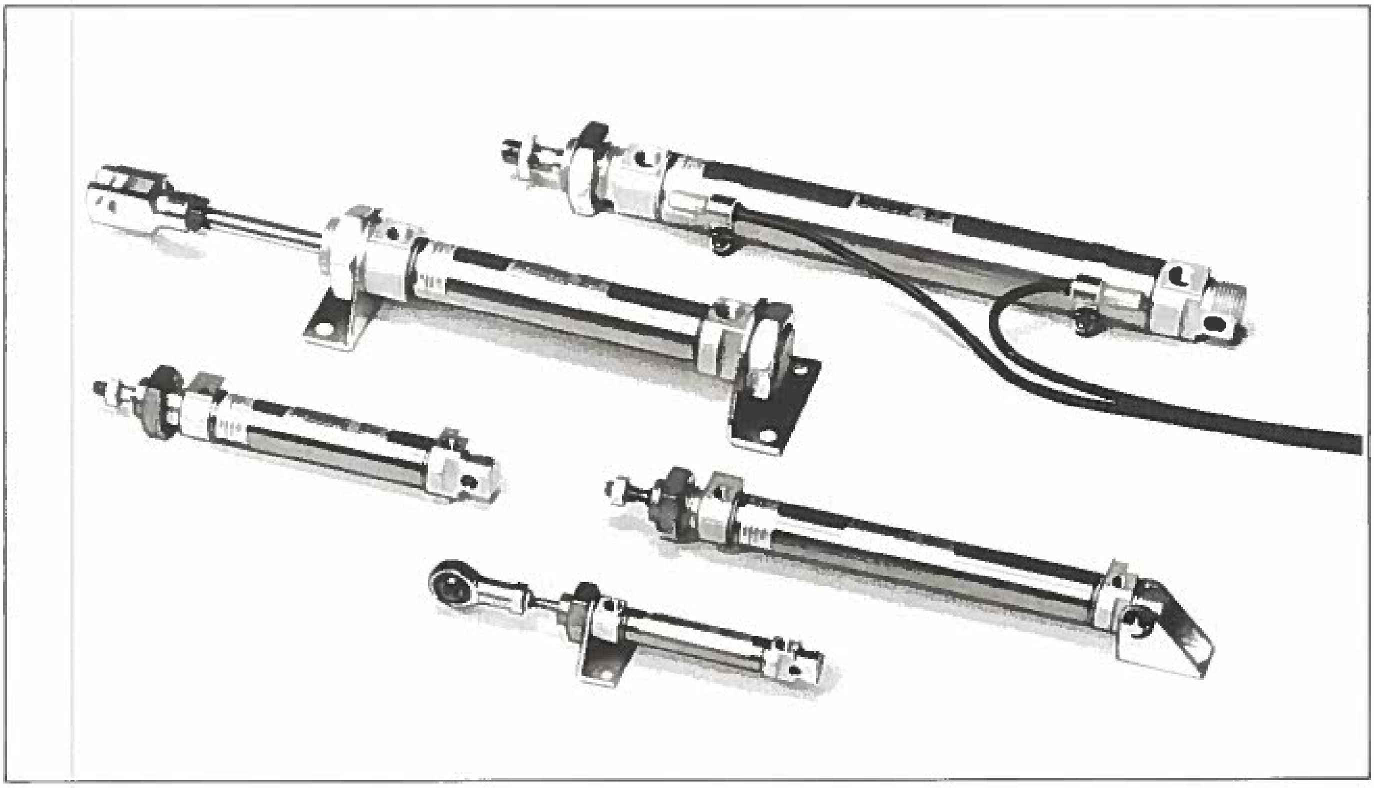
VICKERS

Pneumatics

ISO 6432 Miniature power cylinders

Single acting and double acting - C series
10, 12, 16, 20, 25mm bore



1. General description and application benefits

A range of single acting and double acting miniature cylinders with fixed buffer cushioning or adjustable air cushioning.

- Simple reliable design
- Conforms to ISO 6432 standard
- Non lube or lube
- Magnetic piston as standard
- Adjustable air cushioning (Double acting cylinders 16mm – 25mm bore)
- Rear cap fixed eye mounting as standard
- Full range of mounting accessories
- Stainless steel barrel and piston rod
- Standard strokes 10 – 200mm
- Bronze piston rod bearing

2. Functional symbols

C***1DV x ***

C***1NV x ***

C***2NV x ***

3. Model code – cylinders

C * * * * * V x * * *

[1] * * * · [2] * · [3] * · [4] * * *

[1] Cylinder bore
010 = 10mm
012 = 12mm
016 = 16mm
020 = 20mm
025 = 25mm

[2] Function
1 = Double acting
2 = Single acting (to push)

[3] Type of cylinder
D = Adjustable air cushioning
N = Fixed buffer cushioning

[4] Stroke
Standard strokes:-

Double acting / fixed buffer cushioning
10, 25, 40, 50, 80, 100, 125, 160, 200mm

Double acting / adjustable air cushioning
40, 50, 80, 100, 125, 160, 200mm

Single acting / fixed buffer cushioning
10, 25, 40mm

Note: *Other non standard strokes available to special order.*

Standard model availability

The table shows the standard product range available although certain strokes may be subject to special order (see page CC 1.3 for preferred model selection).
Non standard strokes available to special order.

Double acting cylinders with fixed buffer cushioning

		Stroke	10	25	40	50	80	100	125	160	200
C0101NV x Stroke	10mm bore cylinder		■	■	■	■	■				
C0121NV x Stroke	12mm bore cylinder		■	■	■	■	■	■	■		
C0161NV x Stroke	16mm bore cylinder		■	■	■	■	■	■	■		
C0201NV x Stroke	20mm bore cylinder			■	■	■	■	■	■	■	
C0251NV x Stroke	25mm bore cylinder			■	■	■	■	■	■	■	■

Double acting cylinders with adjustable air cushioning

		Stroke	10	25	40	50	80	100	125	160	200
C0161DV x Stroke	16mm bore cylinder				■	■	■	■	■		
C0201DV x Stroke	20mm bore cylinder				■	■	■	■	■	■	
C0251DV x Stroke	25mm bore cylinder				■	■	■	■	■	■	■

Single acting cylinders with fixed buffer cushioning

		Stroke	10	25	40	50
C0102NV x Stroke	10mm bore cylinder		■	■	■	
C0122NV x Stroke	12mm bore cylinder		■	■	■	■
C0162NV x Stroke	16mm bore cylinder		■	■	■	■
C0202NV x Stroke	20mm bore cylinder			■	■	■
C0252NV x Stroke	25mm bore cylinder			■	■	■

Preferred model selection

The products listed represent the standard product range most readily available.

Double acting cylinders

	Stroke	10	25	40	50	80	100	125	160	200
C0101NV x Stroke	10mm bore cylinder	■	■		■	■				
C0121NV x Stroke	12mm bore cylinder	■	■		■	■	■			
C0161NV x Stroke	16mm bore cylinder	■	■		■	■	■			
C0201NV x Stroke	20mm bore cylinder		■		■	■	■		■	
C0251NV x Stroke	25mm bore cylinder		■		■	■	■		■	

Single acting cylinders

	Stroke	10	25	40	50
C0102NV x Stroke	10mm bore cylinder	■	■		
C0122NV x Stroke	12mm bore cylinder	■	■		■
C0162NV x Stroke	16mm bore cylinder	■	■		■
C0202NV x Stroke	20mm bore cylinder		■		■
C0252NV x Stroke	25mm bore cylinder		■		■

Typical model codes

C0121NV x 100 = 12mm bore cylinder
Double acting, fixed buffer cushioning
100mm stroke

C0162NV x 50 = 16mm bore cylinder
Single acting, fixed buffer cushioning
50mm stroke

Model code – Mountings

Head and cap flanges – see page CC 2.1
Foot bracket – see page CC 2.1
Rear hinge bracket – see page CC 2.2

Model code – Accessories

Rod clevis complete with pivot pin – see page CC 3.1
Rod spherical bearing – see page CC 3.1

Model code – Magnetic sensors and mounting straps

Solid state switch with PNP output – see page CC 4.1
Reed switch – see page CC 4.2

4. Operating data

Standard	ISO 6432 AFNOR NF E 49030 CETOP RP 43P
Operating pressure range	Single acting – 2.0 to 10 bar (29 to 145 psig) Double acting – 1.0 to 10 bar (14.5 to 145 psig)
Ambient operating temperature range	– 20°C to +70°C (– 4°F to +158°F)
Materials of construction	Barrel – Stainless steel Piston rod – Stainless steel Piston – Bronze (Magnet fitted as standard) End covers – Anodised aluminium alloy Seals – Piston and piston rod – Elastomer nitrile Buffer – Polyurethane
Cushioning	Single and double acting cylinders (10-25mm bore):- Fixed buffer cushioning at each end Double acting cylinders (16-25mm bore):- Adjustable air cushioning at both ends
Type of connection	Screwthread
Port sizes	M5 x 0.8 – 1/8" BSP
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG37 mineral oil.
Cylinder sizing selection and air consumption	See page CC 1.5
Installation dimensions	Basic cylinders - See page CC 1.6 Cylinders with mountings - See pages CC 2.1-2 Cylinder accessories - See page CC 3.1 Magnetic sensor - See pages CC 4.1-2

Mass			
	C0101NVx***	0.043kg + 0.003kg	per 10mm stroke
	C0102NVx***	0.044kg + 0.004kg	per 10mm stroke
	C0121NVx***	0.080kg + 0.005kg	per 10mm stroke
	C0122NVx***	0.084kg + 0.006kg	per 10mm stroke
	C0161NVx***	0.098kg + 0.007kg	per 10mm stroke
	C0161DVx***	0.104kg + 0.007kg	per 10mm stroke
	C0162NVx***	0.106kg + 0.008kg	per 10mm stroke
	C0201NVx***	0.180kg + 0.011kg	per 10mm stroke
	C0201DVx***	0.184kg + 0.011kg	per 10mm stroke
	C0202NVx***	0.200kg + 0.012kg	per 10mm stroke
	C0251NVx***	0.250kg + 0.013kg	per 10mm stroke
	C0251DVx***	0.260kg + 0.013kg	per 10mm stroke
	C0252NVx***	0.270kg + 0.014kg	per 10mm stroke

Selection of related equipment	See page CC 1.7
Mountings	See pages CC 2.1-2
Accessories	See page CC 3.1
Magnetic sensors	See pages CC 4.1-2
Service kits	Replace units

5. Cylinder sizing and useful cylinder calculations

Selection of suitable bore size

1 Establish thrust required and working pressure available.
Determine whether static or dynamic application at this stage. For dynamic applications it is recommended that a thrust of 30% in excess of required loading be allowed.

2 Select working pressure on top of table below.

3 Select force required by reading down from selected working pressure. If exact force is not shown use nearest larger unit.

4 Read off cylinder bore size on left of table.

Piston thrust chart

Thrust in Newtons for double acting cylinders assuming a cylinder efficiency of 80%

Bore diameter mm	Piston area dm^2	Air pressure – bar 1	2	3	4	5	6	7	8	9	10
10	out 0.0078	6	12	18	24	30	36	42	48	54	60
	in 0.0066	5	10	15	20	25	30	35	40	45	50
12	out 0.0113	9	18	27	36	45	54	63	72	81	90
	in 0.0085	7	14	21	28	35	42	49	56	63	70
16	out 0.0201	16	32	48	64	80	96	112	128	144	160
	in 0.0173	14	28	42	56	70	84	98	112	126	140
20	out 0.0314	25	50	75	100	125	150	175	200	225	250
	in 0.0264	21	42	63	84	105	126	147	168	189	210
25	out 0.0491	39	78	117	156	195	234	273	312	351	390
	in 0.0413	33	66	99	132	165	198	231	264	297	330

Useful cylinder calculations

THRUST

$T = P \times A \times 10^3$

T = Thrust (Newtons)
P = Pressure (bar)
A = Effective piston area (dm^2)
This calculation must be reduced by 20% to allow for internal friction within the cylinder. For dynamic application it is recommended that a thrust of 30% in excess of required loading be allowed.

AIR CONSUMPTION

$$C = \frac{A \times L \times N \times (P+101.3)}{101.3}$$

C = Air consumption (dm^3/sec)
A = Effective piston area (dm^2)
L = Stroke (mm)
N = Number of single strokes per second
P = Pressure (bar gauge)

AIR FLOW

$$Q = \frac{A \times L \times (P+101.3)}{T \times 101.3}$$

Q = Air flow (dm^3/sec) free air
A = Effective piston area (dm^2)
L = Stroke (mm)
T = Time to complete single stroke (secs)
P = Pressure (bar gauge)

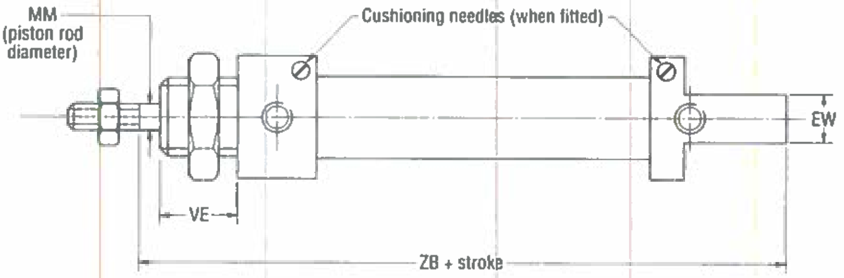
Useful conversions

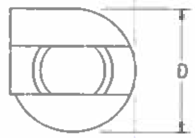
1N = 0.102 kgf
1N = 0.225 lbf
1kgf = 9.807 N

1lbf = 0.454 kgf
1scfm = 0.472 dm^3/sec
1psi = 0.069 bar
60 l/min = 1 dm^3/sec

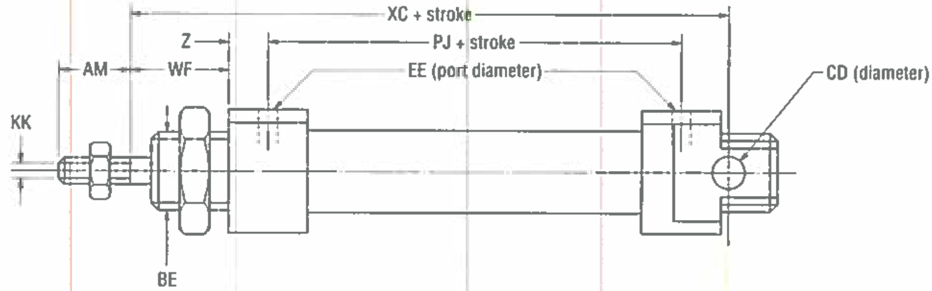
1kg/cm^2 = 0.981 bar
14.5 psi = 1 bar
1 bar = 10^5 Pa

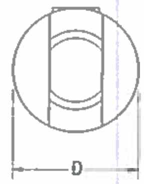
6. Installation dimensions in mm





End cover detail
16mm bore
cylinders





End cover detail
10, 12, 20, 25mm bore
cylinders

Bore	AM	BE	CD	D	EE	EW	KK	MM	PJ	VE	WF	XC	Z	ZB
10	12	M12 x 1.25	4	15.4	M5 x 0.8	8	M4 x 0.70	4	37	14	16	64	5.5	72
12	16	M16 x 1.5	6	20.0	M5 x 0.8	12	M6 x 1.00	6	39	20	22	75	5.5	84
16	16	M16 x 1.5	6	20.4	M5 x 0.8	12	M6 x 1.00	6	45	20	22	82	5.5	90
20	20	M22 x 1.5	8	27.4	G1/8"	16	M8 x 1.25	8	49	22	24	95	9.5	106
25	22	M22 x 1.5	8	27.4	G1/8"	16	M10 x 1.25	10	50.5	24	28	104	9.5	111.5

***Note:** 1 off Cylinder neck nut and piston rod nut supplied as standard.*

7. Ordering procedure

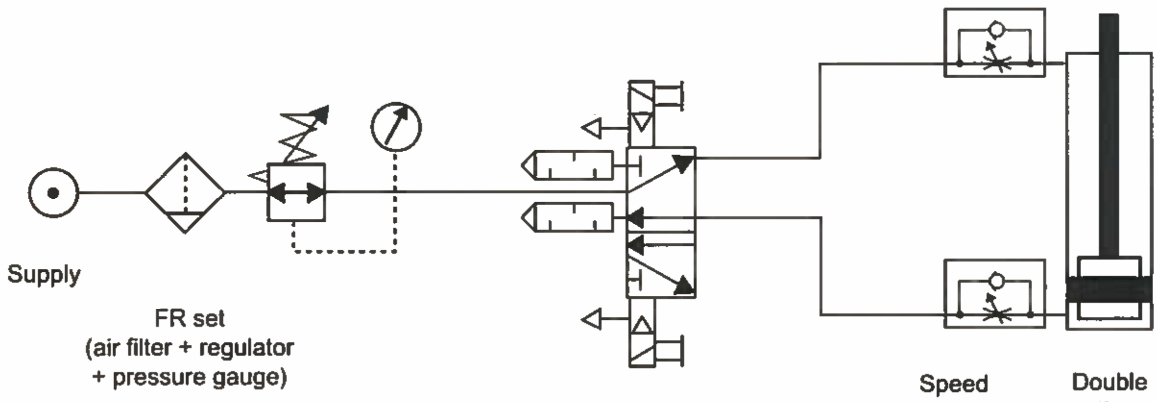
Cylinders only:-
Order in accordance with model codes shown on page CC 1.3.

Cylinders complete with mountings:-
Mountings must be ordered separately in accordance with model codes shown on pages CC 2.1-2.

Cylinder accessories:-
Must be ordered separately in accordance with model codes shown on page CC 3.1.

Cylinders complete with magnetic sensors:-
Magnetic sensors and strap assemblies must be ordered separately in accordance with model codes shown on pages CC 4.1-2.

8. Basic pneumatic circuit diagram



9. Selection of related equipment

Select the related equipment to suit the cylinder bore and speed in accordance with table below – see relevant catalogues for details of product and ordering codes.
All solenoid valves can be free standing or manifold mounted.

Cylinder bore	Theoretical speed (mm/sec)	Required flow rate (dm³/sec) at 6.3 bar	Solenoid valve Single solenoid	Solenoid valve Double solenoid	Speed controller	Silencer
10	>500	0.25	4KA110	4KA120	SC3G – M5 – 4	PSPM5
12	>500	0.40	4KA110	4KA120	SC3G – M5 – 4	PSPM5
16	>500	0.55	4KA110	4KA120	SC3G – M5 – 4	PSPM5
20	400	0.75	4KB110	4KB120	SC3G – 6 – 6	PSP13
25	400	1.15	4KB110	4KB120	SC3G – 6 – 6	PSP13

Explanation of terms

Theoretical speed – indicates the degree of cylinder speed, and is approximately equivalent to the speed at no load.
Required flow rate – indicates the instantaneous flow rate at the time the cylinder starts to operate.

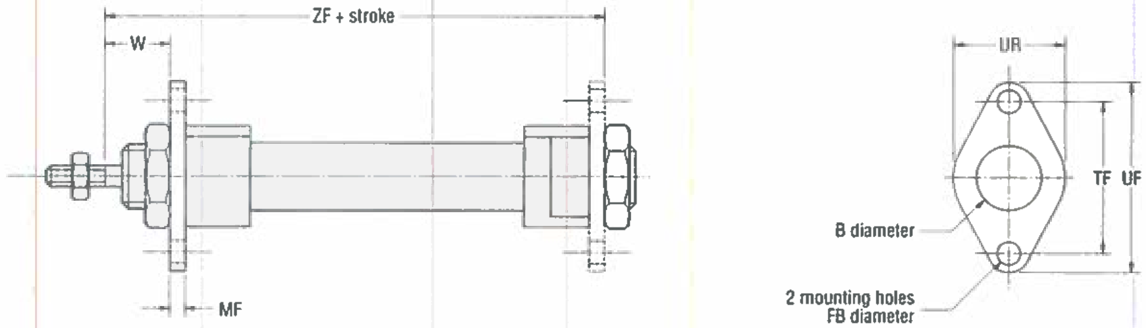
VICKERS

Pneumatics

Mountings

1. Head and cap flange – to ISO 6432

Installation dimensions in mm, model code and mass



Cylinder bore	B	FB	MF	TF	UF	UR	W	ZF
10	12	4.5	1.5	30	39	19	14.5	65.5
12	16	5.5	2.0	40	54	26	20.0	74
16	16	5.5	2.0	40	54	26	20.0	80
20	22	6.6	2.5	50	64	36	21.5	94.5
25	22	6.6	2.5	50	64	36	25.5	100

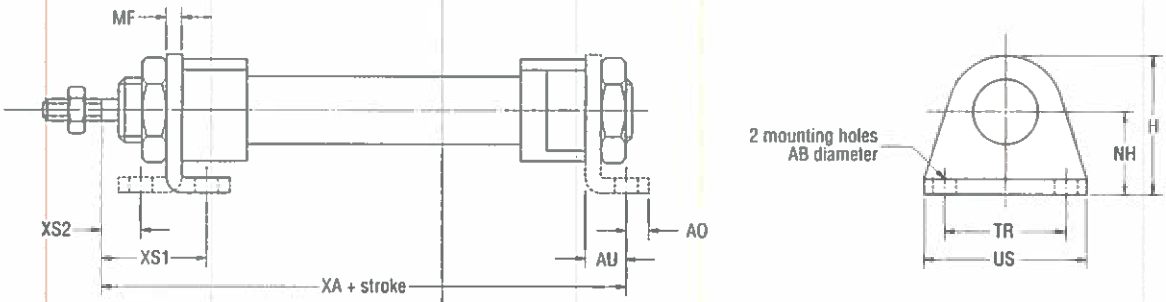
Model code

Cylinder bore	Flange	Mass	Neck nut	Mass
10	C010S – MF1K	0.010kg	C010 – 11	0.008kg
12 and 16	C012S – MF1K	0.020kg	C012 – 11	0.015kg
20 and 25	C020S – MF1K	0.030kg	C020 – 11	0.020kg

***Note:** 1 off cylinder neck nut supplied as standard with cylinder.*

2. Foot bracket – to ISO 6432

Installation dimensions in mm, model code and mass



Cylinder bore	AB	AU	AO	H	MF	NH	TR	US	XA	XS1	XS2
10	4.5	9.5	4.5	22.5	1.5	16	25	34	73.5	24	6.5
12	5.5	12	7	33	2.0	20	32	46	84	32	10
16	5.5	12	7	33	2.0	20	32	46	90	32	10
20	6.6	14.5	7	43	2.5	25	40	54	106.5	36	9.5
25	6.6	14.5	7	43	2.5	25	40	54	112	40	13.5

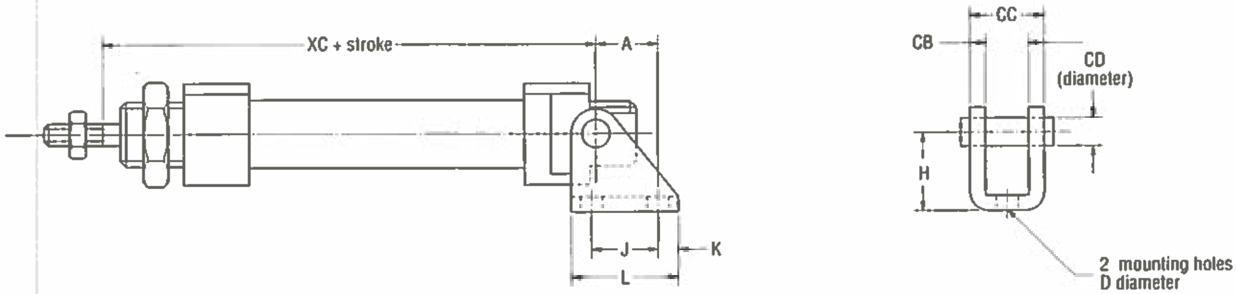
Model code

Cylinder bore	Foot bracket	Mass	Neck nut	Mass
10	C010S – MS1K	0.010kg	C010 – 11	0.008kg
12 and 16	C012S – MS1K	0.020kg	C012 – 11	0.015kg
20 and 25	C020S – MS1K	0.030kg	C020 – 11	0.020kg

***Note:** 1 off cylinder neck nut supplied as standard with cylinder*

3. Rear hinge bracket – to ISO 6432

Installation dimensions in mm, model code and mass



Cylinder bore	A	CB	CC	CD	D	H	J	K	L	XC
10	11.5	8	11	4	4.5	16	11	5.5	21	64
12	7.5	12	16	6	5.5	20	15	7.5	30	75
16	7.5	12	16	6	5.5	20	15	7.5	30	82
20	18.5	16	21	8	6	25	18	9	35	95
25	18.5	16	21	8	6	25	18	9	35	104

Model code

Cylinder bore	Rear hinge bracket	Mass
10	C010S – MP3BK	0.010kg
12 and 16	C012S – MP3BK	0.020kg
20 and 25	C020S – MP3BK	0.030kg

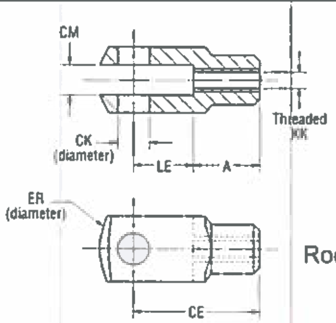
4. Ordering procedure

Order in accordance with model codes shown to suit installation requirements and relevant cylinder bore.

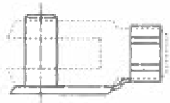
Accessories

1. Rod clevis with pivot pin – to ISO 8140

Installation dimensions in mm and model code



Rod clevis



Retained pivot pin

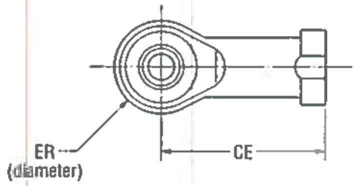
Cylinder bore	A	CE	CK	CL	CM	ER	KK	LE
10	8	16	4	8	4	10	M4 x 0.70	8
12 and 16	12	24	6	12	6	14	M6 x 1.00	12
20	16	32	8	16	8	20	M8 x 1.25	16
25	20	40	10	20	10	16	M10 x 1.25	20

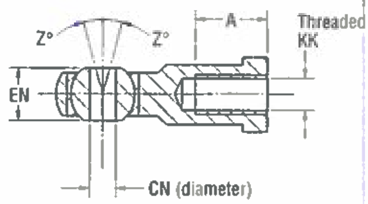
Model code

Cylinder bore	Rod spherical bearing	Mass
10	C010S – FEK	0.015kg
12 and 16	C012S – FEK	0.020kg
20	C020S – FEK	0.030kg
25	C025S – FEK	0.040kg

2. Rod spherical bearing – to ISO 8139

Installation dimensions in mm and model code





Cylinder bore	A	CE	CN	EN	ER	KK	Z°
10	10	27	5	8	18	M4 x 0.70	4°
12 and 16	12	30	6	9	20	M6 x 1.00	4°
20	16	36	8	12	24	M8 x 1.25	4.5°
25	20	43	10	14	28	M10 x 1.25	4.5°

Model code

Cylinder bore	Rod spherical bearing	Mass
10	C010S – SREK	0.015kg
12 and 16	C012S – SREK	0.020kg
20	C020S – SREK	0.030kg
25	C025S – SREK	0.040kg

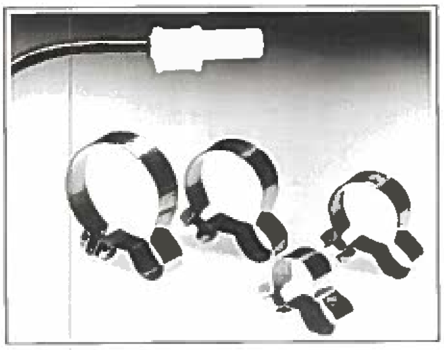
3. Ordering procedure

Order in accordance with model codes shown to suit installation requirements and relevant cylinder bore.

ISO 6432 Miniature power cylinders

Magnetic sensors - Solid state (PNP) switch

10, 12, 16, 20, 25mm



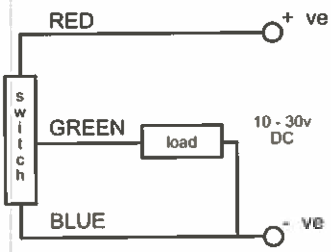
1. General description and application benefits

Continuously rated PNP operation solid state switch with LED indicator and 2 metre flying lead for use on all sizes of 'C' range miniature cylinders.

Switch is fitted to cylinder barrel by means of strap assembly to suit bore size.

- Compact
- Integral LED indicator (Red)
- Ease of fitting

PNP switch operation



2. Functional symbols

3. Model code

Preferred model selection

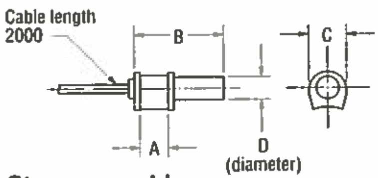
885381	PNP switch with 2 metre flying lead
885387	Strap assembly for 10mm bore cylinder
885388	Strap assembly for 12mm bore cylinder
885389	Strap assembly for 16mm bore cylinder
885390	Strap assembly for 20mm bore cylinder
885391	Strap assembly for 25mm bore cylinder

4. Operating data

Contact function	Normally open	
Protection	IP 67	
Voltage	10 – 30v DC	
Voltage drop (maximum)	1.0v	
Current (maximum)	400mA	
Switching capacity	12w	
Switch ON time	1.5 microseconds	
Switch OFF time	0.5 microseconds	
Repeatability	0.1mm	
Working temperature	– 10°C to +70°C (+15°F to +158°F)	
Body housing	Nylon 66	
Cable length	2 metres	
Cable specification	3 core (7 x 0.2mm²)	
LED indication	Red	
Method of switch fixing	Stainless steel strap assembly	
Mass – switch	885381	0.038kg
– strap assembly	885387	0.003kg
	885388	0.003kg
	885389	0.004kg
	885390	0.004kg
	885391	0.004kg

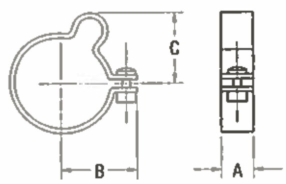
5. Installation dimensions in mm

Switch 885381



A	B	C	D
8	27	9	7

Strap assembly



Model code	A	B	C
885387	8	13	14
885388	8	15	15
885389	8	16	16
885390	8	18	20
885391	8	21	20

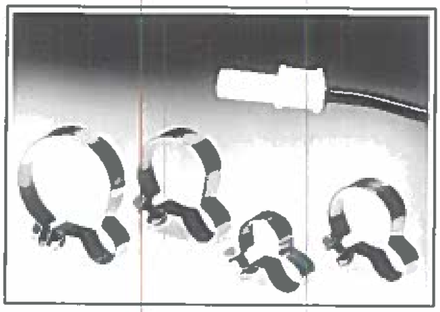
6. Ordering procedure

Order in accordance with preferred model selection shown above to suit installation requirements and cylinder diameter.

ISO 6432 Miniature power cylinders

Magnetic sensors - Reed switch

10, 12, 16, 20, 25mm



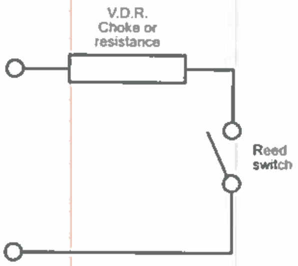
1. General description and application benefits

Continuously rated reed switch with LED indicator and 2 metre flying lead for use on all sizes of 'C' range miniature cylinders.

Switch is fitted to cylinder barrel by means of strap assembly to suit bore size.

- Compact
- Integral LED indicator (Red)
- Ease of fitting

Reed switch operation



Warning:

For cable runs over 5m protect switch from inrush either by using a 680mh choke or a resistor fitted in series.

For inductive loads a voltage dependent resistor with a higher clamping voltage than the supply must be used.

Protection must be fitted within 2m of the switch.

2. Functional symbols

3. Model code

Preferred model selection

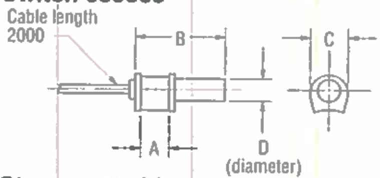
885383	Reed switch with 2 metre flying lead
885387	Strap assembly for 10mm bore cylinder
885388	Strap assembly for 12mm bore cylinder
885389	Strap assembly for 16mm bore cylinder
885390	Strap assembly for 20mm bore cylinder
885391	Strap assembly for 25mm bore cylinder

4. Operating data

Contact function	Normally open	
Protection	IP 67	
Voltage (maximum)	110v AC / 200v DC	
Voltage drop (maximum)	3.0v	
Current (maximum)	180mA	
Switching capacity	10w	
Switch ON time	1.5 milliseconds	
Switch OFF time	1.5 milliseconds	
Repeatability	0.1mm	
Working temperature	– 10°C to +70°C (+15°F to + 158°F)	
Body housing	Nylon 66	
Cable length	2 metres	
Cable specification	2 core (7 x $0.2mm^2$)	
LED indication	Red	
Method of switch fixing	Stainless steel strap assembly	
Mass – switch	885383	0.076kg
– strap assembly	885387	0.003kg
	885388	0.003kg
	885389	0.004kg
	885390	0.004kg
	885391	0.004kg

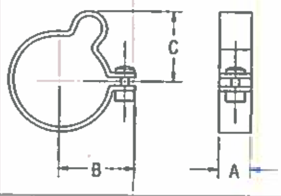
5. Installation dimensions in mm

Switch 885383



A	B	C	D
8	27	9	7

Strap assembly



Model code	A	B	C
885387	8	13	14
885388	8	15	15
885389	8	16	16
885390	8	18	20
885391	8	21	20

6. Ordering procedure

Order in accordance with preferred model selection shown above to suit installation requirements and cylinder diameter.

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
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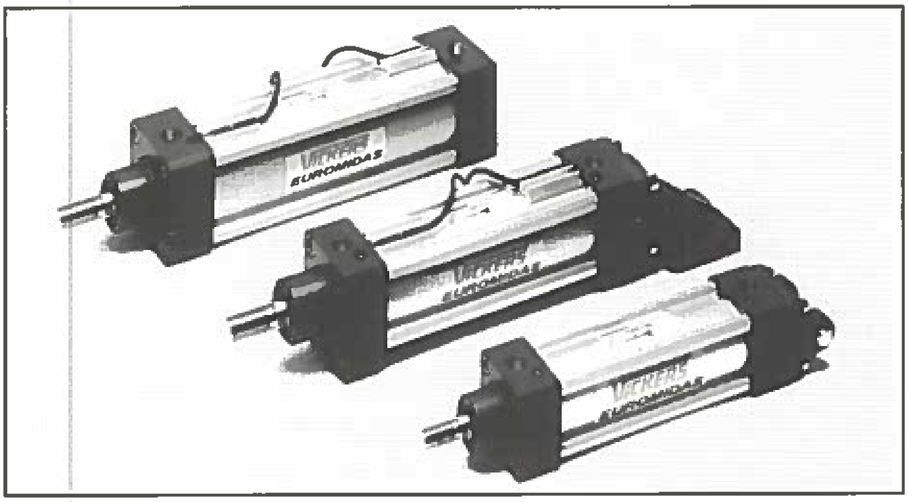
VICKERS

Pneumatics

EUROMIDAS Power cylinders

Double acting - C / CE series
32, 40, 50, 63, 80, 100mm bore



1. General description and application benefits

A range of double acting, fully adjustable cushioned metric cylinders to VDMA, ISO, CNOMO and DIN standards

- Innovative design.
- Meets International and European standards.
- Clean lines.
- Profile barrels.
- Magnetic piston (option).
- Small switches fit within rail mounting directly to cylinder barrel.
- Lube free.
- Non standard strokes available.
- Suitable for Automotive, Food and many other industries.

2. Functional symbol

3. Preferred model selection

Non magnetic piston

Bore	Model code	Stroke 25	50	80	100	125	160	200	250	320
32mm	C0321DxStroke	■	■	■	■	■	■	■	■	■
40mm	C0401DxStroke	■	■	■	■	■	■	■	■	■
50mm	C0501DxStroke	■	■	■	■	■	■	■	■	■
63mm	C0631DxStroke	■	■	■	■	■	■	■	■	■
80mm	C0801DxStroke	■	■	■	■	■	■	■	■	■
100mm	C1001DxStroke	■	■	■	■	■	■	■	■	■

Ordering example:-
C0401Dx100 = 40mm bore double acting cylinder x 100mm stroke.

Magnetic piston

Bore	Model code	Stroke 25	50	80	100	125	160	200	250	320
32mm	CE0321DxStroke	■	■	■	■	■	■	■	■	■
40mm	CE0401DxStroke	■	■	■	■	■	■	■	■	■
50mm	CE0501DxStroke	■	■	■	■	■	■	■	■	■
63mm	CE0631DxStroke	■	■	■	■	■	■	■	■	■
80mm	CE0801DxStroke	■	■	■	■	■	■	■	■	■
100mm	CE1001DxStroke	■	■	■	■	■	■	■	■	■

Ordering example:-
CE0631Dx160 = 63mm bore double acting cylinder x 160mm stroke with magnetic piston.

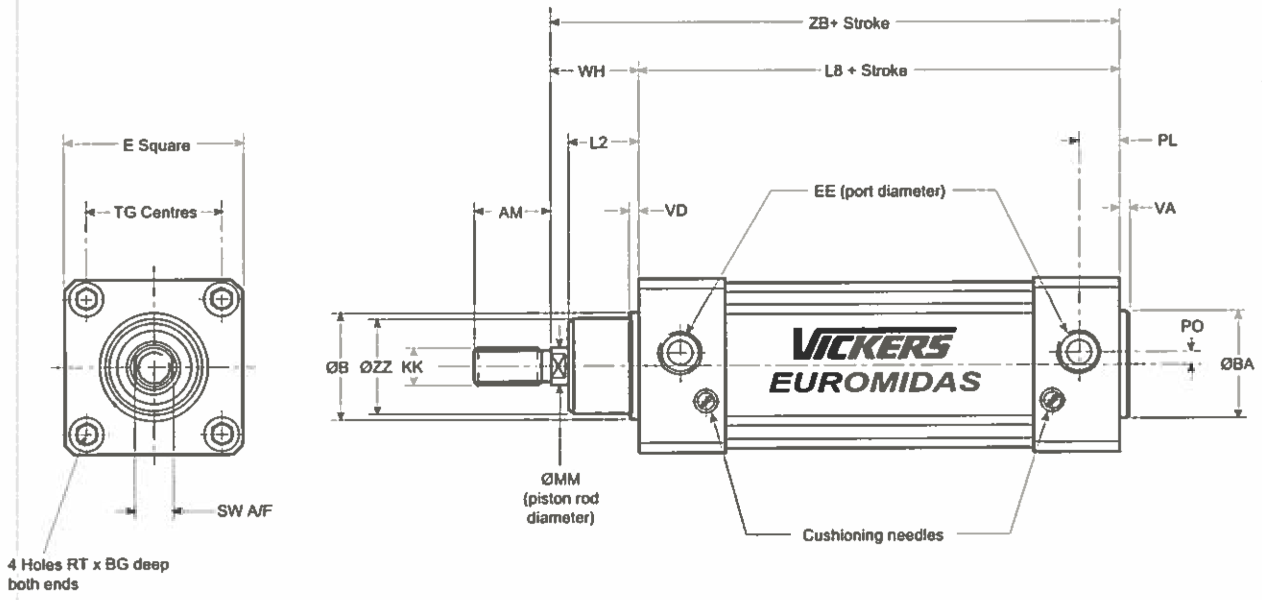
Other models available

- Through rod.
- Gaitered..
- Details of other special models on request.

4. Operating data

Standards	ISO 6431 VDMA CNOMO DIN BS4862 CETOP
Operating pressure	1.0 - 10 bar (14.5 - 145 psig)
Ambient operating temperature range	-20° C to + 75° C (-4°F to + 158° F)
Materials of construction	Barrel - Hard anodised aluminium alloy Piston rod - Stainless steel Piston -Aluminium End covers - Aluminium alloy, hard epoxy coated. Seals - Polyurethane Mountings - Aluminium alloy, hard epoxy coated Steel, zinc plated
Cushioning	Fully adjustable air cushioning at both ends
Cushioning length	32mm bore cylinders - 15mm 40mm bore cylinders - 12mm 50mm bore cylinders - 14mm 63mm bore cylinders - 14mm 80mm bore cylinders - 20mm 100mm bore cylinders - 22mm
Type of connection	Screwthread
Port size	1/4" BSP - 1/2" BSP
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG 37 mineral oil.
Installation dimensions	Basic cylinders - See page EM 1.3 Cylinder options - See page EM 2.1 Cylinders with mountings - See pages EM 3.1-2 Cylinder accessories - See page EM 3.2 Magnetic sensors - See page EM 4.2
Mass - Basic cylinders (Zero stroke)	C0321Dx*** 0.506kg + 0.051kg per 25mm stroke C0401Dx*** 0.806kg + 0.072kg per 25mm stroke C0501Dx*** 1.367kg + 0.111kg per 25mm stroke C0631Dx*** 1.870kg + 0.122kg per 25mm stroke C0801Dx*** 2.800kg + 0.220kg per 25mm stroke C1001Dx*** 3.760kg + 0.270kg per 25mm stroke CE0321Dx*** 0.511kg + 0.051kg per 25mm stroke CE0401Dx*** 0.811kg + 0.072kg per 25mm stroke CE0501Dx*** 1.372kg + 0.111kg per 25mm stroke CE0631Dx*** 1.875kg + 0.122kg per 25mm stroke CE0801Dx*** 2.820kg + 0.230kg per 25mm stroke CE1001Dx*** 3.780kg + 0.280kg per 25mm stroke
Mass - Options	Through rod cylinders - as above + additions as shown on page EM 2.1 Gaitered cylinders - as above + additions as shown on page EM 2.1
Mountings	See pages EM 3.1-2
Accessories	See page EM 3.2
Magnetic sensors	See pages EM 4.1-2
Service kits	C*0321Dx*** Series KC228 Mass 0.04kg C*0401Dx*** Series KC229 Mass 0.05kg C*0501Dx*** Series KC230 Mass 0.15kg C*0631Dx*** Series KC231 Mass 0.16kg C*0801Dx*** Series KC232 Mass 0.18kg C*1001Dx*** Series KC233 Mass 0.20kg

5. Installation dimensions in mm



Bore	AM	B	BA	BG	E	EE	KK	L2	L8	MM
32	20	30	30	13.5	46.5	G1/8"	M10 x 1.25	20.5	94	12
40	24	35	35	16	52	G1/4"	M12 x 1.25	22.5	105	16
50	32	40	40	16	64	G1/4"	M16 x 1.5	29.5	106	20
63	32	45	45	16	74	G3/8"	M16 x 1.5	29.5	121	20
80	40	45	45	16	97	G3/8"	M20 x 1.5	30	128	25
100	40	55	55	16	116	G1/2"	M20 x 1.5	32	138	25

Bore	PL	PO	SW	TG	RT	VA	VD	WH	ZB	ZZ
32	13	4	10	32.5	M6	3.5	4	26	120	29
40	14	3	13	38	M6	3.5	4	30	135	32
50	14.5	2	16	46.5	M8	3.5	4	37	143	39
63	17	0	16	56.5	M8	3.5	4	37	158	40
80	21.5	7	22	72	M10	3.5	5	46	178	44
100	21.6	7.5	22	89	M10	3.5	5	51	190	45

Cylinder options

Double acting through rod - C / CE series
32, 40, 50, 63, 80, 100mm bore

1. Model code

Bore	Model
32	C*0324D x stroke
40	C*0404D x stroke
50	C*0504D x stroke
63	C*0634D x stroke
80	C*0804D x stroke
100	C*1004D x stroke

** Note: CE = Magnetic piston , C = Non magnetic piston*

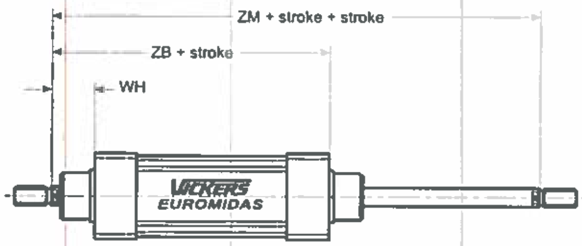
2. Functional symbol

3. Operating data

All operating data is consistent with that for standard cylinders shown on page EM 1.2

Mass	Mass for standard cylinder as given on page EM 1.2 plus		
	C*0324D x ***	0.06kg + 0.06kg per 25mm stroke	
	C*0404D x ***	0.17kg + 0.08kg per 25mm stroke	
	C*0504D x ***	0.34kg + 0.13kg per 25mm stroke	
	C*0634D x ***	0.36kg + 0.13kg per 25mm stroke	
	C*0804D x ***	0.62kg + 0.18kg per 25mm stroke	
	C*1004D x ***	0.64kg + 0.18kg per 25mm stroke	
Service kits	C*0324D x ***	KC234	Mass 0.05kg
	C*0404D x ***	KC235	Mass 0.06kg
	C*0504D x ***	KC236	Mass 0.16kg
	C*0634D x ***	KC237	Mass 0.17kg
	C*0804D x ***	KC238	Mass 0.21kg
	C*1004D x ***	KC239	Mass 0.26kg

4. Installation dimensions in mm



Bore	WH	ZB	ZM
32	26	120	146
40	30	135	165
50	37	143	180
63	37	158	195
80	46	174	220
100	51	189	240

Double acting gaitered- C / CE series
32, 40, 50, 63, 80, 100mm bore

1. Model code

Bore	Model
32	C*0321DG[1] x stroke
40	C*0401DG[1] x stroke
50	C*0501DG[1] x stroke
63	C*0631DG[1] x stroke
80	C*0801DG[1] x stroke
100	C*1001DG[1] x stroke

*Note: * CE = Magnetic piston , C = Non magnetic piston*

2. Operating data

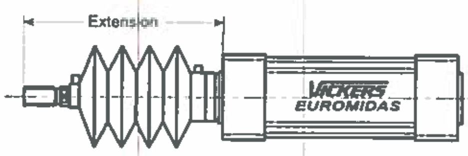
All operating data is consistent with that for standard cylinders shown on page EM 1.2

Mass	Mass for standard cylinder as given on page EM 1.2 plus	
	C*0321DG[1] x ***	0.25kg + 0.05kg per 100mm stroke
	C*0401DG[1] x ***	0.25kg + 0.05kg per 100mm stroke
	C*0501DG[1] x ***	0.30kg + 0.08kg per 100mm stroke
	C*0631DG[1] x ***	0.30kg + 0.08kg per 100mm stroke
	C*0801DG[1] x ***	0.40kg + 0.09kg per 100mm stroke
	C*1001DG[1] x ***	0.40kg + 0.09kg per 100mm stroke

[1] = Stroke range letter:- A = 0 - 100mm, B = 101 - 200mm, C = 201 - 300mm, D = 301 - 400mm, E = 401 - 500mm, F = 501 - 600mm, G = 601 - 700mm, H = 701 - 800mm, J = 801 - 900mm, K = 901 - 1000mm.

3. Installation dimensions in mm

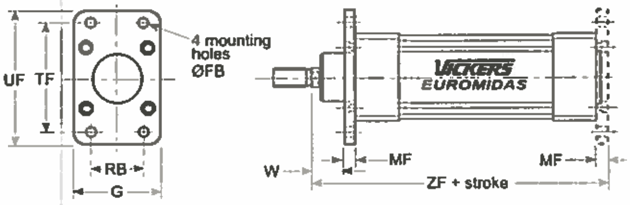
Piston rod extension over standard for stroke ranges shown



Bore	Stroke range reference letter									
	A	B	C	D	E	F	G	H	J	K
32	28	44	60	76	92	108	124	140	156	172
40	28	44	60	76	92	108	124	140	156	172
50	24	32	40	48	56	64	72	80	88	96
63	24	32	40	48	56	64	72	80	88	96
80	24	32	40	48	56	64	72	80	88	96
100	24	32	40	48	56	64	72	80	88	96

Mountings

Front (MF1) and rear (MF2) flange

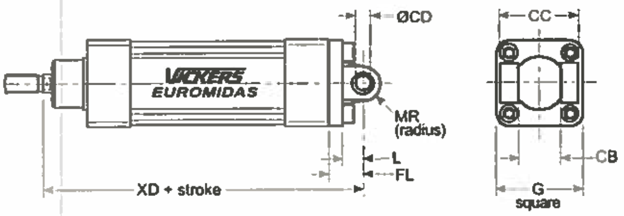


Model code, installation dimensions in mm and mass

Bore	Kit number	FB	G	MF	RB	TF	UF	W	ZF	Mass
32	C032S - MF1K	7	50	10	32	64	79	16	130	0.25kg
40	C040S - MF1K	9	56	10	36	72	90	20	145	0.29kg
50	C050S - MF1K	9	70	12	45	90	110	25	155	0.53kg
63	C063S - MF1K	9	77	12	50	100	120	25	170	0.62kg
80	C080S - MF1K	12	100	16	63	126	153	30	190	1.25kg
100	C100S - MF1K	14	120	16	75	150	178	35	205	2.25kg

Note: *1) Kit number C***S - MF1KI is suitable for front or rear fitment*
2) Kit supplied complete with fixing screws

Rear clevis (MP2)

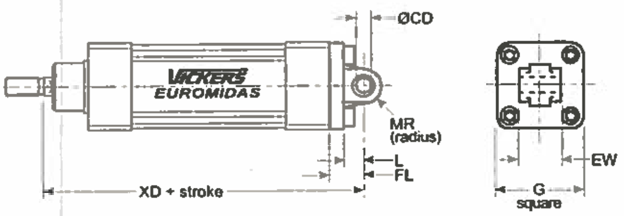


Model code, installation dimensions in mm and mass

Bore	Kit number	CB	CC	CD	FL	G	L	MR	XD	Mass
32	C032S - MP2K	26	45	10	22	45	12	9	142	0.08kg
40	C040S - MP2K	28	52	12	25	52	15	13	160	0.12kg
50	C050S - MP2K	32	60	12	27	63	15	13	170	0.19kg
63	C063S - MP2K	40	70	16	32	73	20	15	190	0.26kg
80	C080S - MP2K	50	90	16	36	95	24	15	210	0.47kg
100	C100S - MP2K	60	110	20	41	115	29	18	230	0.74kg

Note: *1) Pivot pin is supplied separately - see page EM 3.2*
2) Kit supplied complete with fixing screws

Rear eye (MP4)

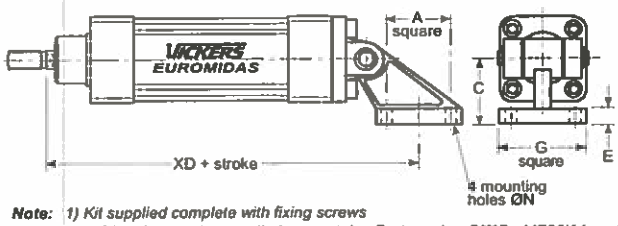


Model code, installation dimensions in mm and mass

Bore	Kit number	CD	EW	FL	G	L	MR	XD	Mass
32	C032S - MP4K	10	26	22	45	12	9	142	0.09kg
40	C040S - MP4K	12	28	25	52	15	13	160	0.14kg
50	C050S - MP4K	12	32	27	63	15	13	170	0.23kg
63	C063S - MP4K	16	40	32	73	20	15	190	0.32kg
80	C080S - MP4K	16	50	36	95	24	15	210	0.51kg
100	C100S - MP4K	20	60	41	115	29	18	230	0.80kg

Note: *1) Pivot pin is supplied separately - see page EM 3.2*
2) Kit supplied complete with fixing screws

Rear 90° hinge (MP2 + 90° bracket + pivot pin)

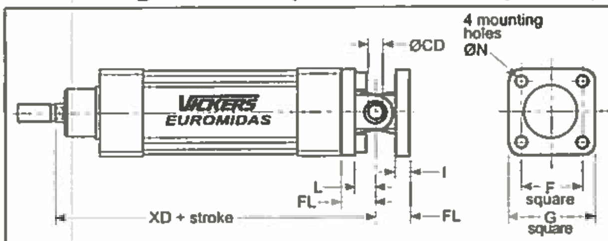


Model code, installation dimensions in mm and mass

Bore	Kit number	A	C	E	G	N	XD	Mass
32	C032S - MP29K	33	32	10	45	6.5	170	0.17kg
40	C040S - MP29K	40	45	10	52	6.5	201	0.28kg
50	C050S - MP29K	49	45	12	65	8.5	211	0.43kg
63	C063S - MP29K	59	63	12	75	8.5	247	0.64kg
80	C080S - MP29K	75	63	14	95	10.5	267	1.05kg
100	C100S - MP29K	90	90	16	115	10.5	305	1.90kg

Note: *1) Kit supplied complete with fixing screws*
*2) 90° bracket can be supplied separately - Part number C***S - MP90K (e.g. For 32mm bore cylinder order as C032S - MP90K)*

Rear hinge mount (MP2 + MP4 + pivot pin)



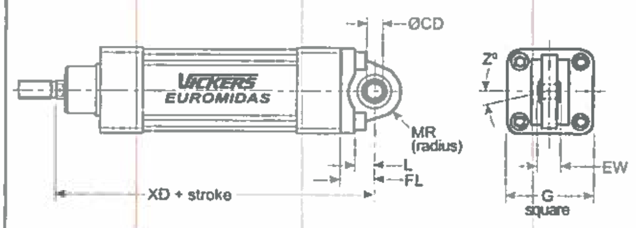
Model code, installation dimensions in mm and mass

Bore	Kit number	CD	F	FL	G	I	L	N	XD	Mass
32	C032S - MP24K	10	32.5	22	45	10	12	6.5	142	0.18kg
40	C040S - MP24K	12	38	25	52	10	15	6.5	160	0.32kg
50	C050S - MP24K	12	46.5	27	63	12	15	9	170	0.42kg
63	C063S - MP24K	16	56.5	32	73	12	20	9	190	0.63kg
80	C080S - MP24K	16	72	36	95	12	24	11	210	1.07kg
100	C100S - MP24K	20	89	41	115	12	29	11	230	1.72kg

Note: *1) Kit supplied complete with fixing screws*

Mountings (cont)

Rear eye with bearing (MP6)

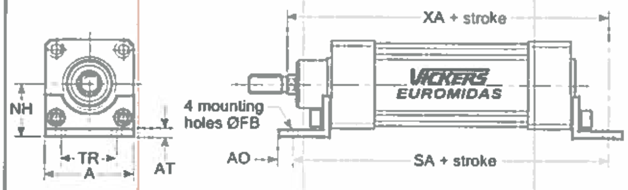


Note: 1) Pivot pin is supplied separately - see below
2) Kit supplied complete with fixing screws

Model code, installation dimensions in mm and mass

Bore	Kit number	CD	EW	FL	G	L	MR	XD	Z°	Mass
32	C032S - MP6K	10	14	22	45	12	16	142	13	0.10kg
40	C040S - MP6K	12	16	25	52	15	20	160	13	0.14kg
50	C050S - MP6K	12	16	27	63	15	20	170	15	0.22kg
63	C063S - MP6K	16	21	32	73	20	24	190	15	0.32kg
80	C080S - MP6K	16	21	36	95	24	24	210	15	0.52kg
100	C100S - MP6K	20	25	41	115	29	30	230	15	0.77kg

Feet (MS1)



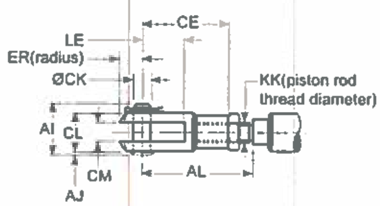
*Note: 1) Kit M***S - MS1K is supplied as a pair*
2) Kit supplied complete with fixing screws

Model code, installation dimensions in mm and mass

Bore	Kit number	A	AT	AO	FB	NH	SA	TR	XA	Mass
32	C032S - MS1K	47	3	8	7	32	142	32	144	0.15kg
40	C040S - MS1K	53	3	10	9	36	161	36	163	0.20kg
50	C050S - MS1K	65	3	10	9	45	170	45	175	0.32kg
63	C063S - MS1K	75	3	10	9	50	185	50	190	0.48kg
80	C080S - MS1K	95	4	14	12	63	210	63	215	1.00kg
100	C100S - MS1K	115	4	15	14	71	220	75	230	1.35kg

Accessories

Fork end with pivot pin

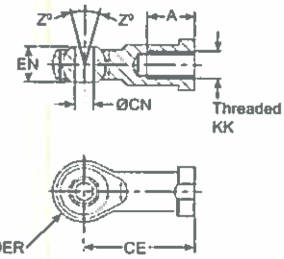


Model code

Bore	
32	C025S - FEK
40	M040S - FEK
50 & 63	M063S - FEK
80 & 100	M080S - FEK

Bore	AI	AJ	AL (min)	AL (max)	CE	CK	CL	CM	ER	KK	LE	Mass
32	28	2.5	47	52	40	10	20	10	16	M10x1.25	20	0.04kg
40	32.5	3.0	57	60	48	12	24	12	19	M12x1.25	24	0.15kg
50&63	42	3.5	74	80	64	16	32	16	25	M16x1.50	32	0.35kg
80&100	52.5	4.0	92	101	80	20	40	20	32	M20x1.50	40	0.75kg

Rod spherical bearing

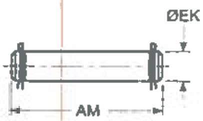


Model code

Bore	
32	C025S - SREK
40	M040S - SREK
50 & 63	M063S - SREK
80 & 100	M080S - SREK

Bore	A	CE	CN	EN	ER	KK	Z°	Mass
32	20	43	10	14	28	M10x1.25	4.5°	0.04kg
40	22	50	12	16	32	M12x1.25	13°	0.11kg
50 & 63	28	64	16	21	42	M16x1.50	15°	0.21kg
80 & 100	33	77	20	25	50	M20x1.50	15°	0.38kg

Pivot pin



Note: Pivot supplied complete with 2 off spring clips.

Model code

Bore	
32	C032S - PP
40	C040S - PP
50	C050S - PP
63	C063S - PP
80	C080S - PP
100	C100S - PP

Bore	AM	EK	Mass
32	51	9.94	0.03kg
40	58	11.94	0.04kg
50	66	11.94	0.05kg

Bore	AM	EK	Mass
63	76	15.94	0.11kg
80	88	15.94	0.15kg
100	120	19.93	0.25kg

Piston rod locknut

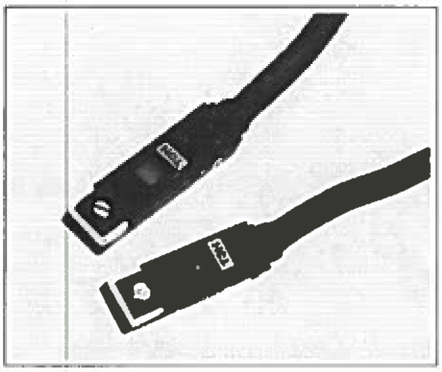
Model code

Bore	
32	M0251 - 9
40	M0401 - 9
50 & 63	M0631 - 9
80 & 100	M0801 - 9

Bore	Thread size	Mass
32	M10 x 1.25	0.01kg
40	M12 x 1.25	0.01kg
50 & 63	M16 x 1.50	0.02kg
80 & 100	M20 x 1.50	0.03kg

EUROMIDAS Power cylinders

Magnetic sensors - Proximity switch Type T3H and Reed switch Type T0H
32, 40, 50, 63, 80, 100mm



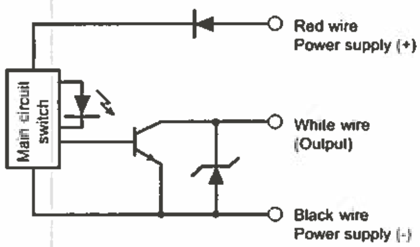
1. General description and application benefits

Continuously rated proximity and reed switches with LED indicator and flying lead.
Programmable controller relay operation.

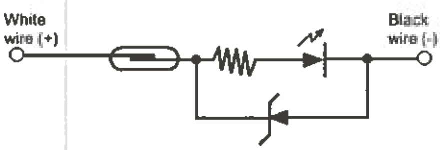
- Switches fit within cylinder body envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagrams of switches

Proximity switch T3H3



Reed switch T0H3



3. Preferred model selection

Proximity switch

Model code	Description
T3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
T3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

Reed switch

Model code	Description
T0H3	Axial lead wire reed switch with 3metre flying lead (Standard)
T0H5	Axial lead wire reed switch with 5 metre flying lead (Optional)

Switch mounting rail

Model code	Description
C032 - 67K	Switch mounting rail (2) for 32mm bore cylinders
C040 - 67K	Switch mounting rail (2) for 40mm bore cylinders
C050 - 67K	Switch mounting rail (2) for 50mm bore cylinders
C063 - 67K	Switch mounting rail (2) for 63mm bore cylinders
C080 - 67K	Switch mounting rail (2) for 80mm bore cylinders
C100 - 67K	Switch mounting rail (2) for 100mm bore cylinders

Note:- Switch mounting rail is supplied as pair of units with cleaning pad.

4. Operating data

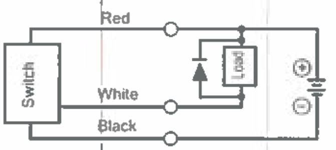
Ambient operating temperature range	-10^0 C to + 60^0 C (14^0 F to + 140^0 F)	
Load voltage/current	T3H3 - 30vDC or less/100mA or less T0H3 - 12, 24vDC/ 5 to 50mA 110vAC/ 7 to 20mA	
Power consumption	T3H3 - 24vDC (ON) 10mA or less	
Leakage current	T3H3 - 10 µA or less	
Maximum impulse	T3H3 - 100G T0H3 - 30G	
Protection	IEC standard IP67	
Lead wire	T3H3 - Oil proof 3 core vinyl cabtyre cord 0.2mm^2 T0H3 - Oil proof 2 core vinyl cabtyre cord 0.2mm^2	
Insulation resistance	More than 20MΩ at 500v DC megger	
LED indication	Red (ON)	
Mass	T3H3	0.054kg
	T3H5	0.075kg
	T0H3	0.054kg
	T0H5	0.075kg
	C032-67K	0.010kg
	C040-67K	0.010kg
	C050-67K	0.010kg
	C063-67K	0.010kg
	C080-67K	0.010kg
	C100-67K	0.010kg

5. Installation requirements

Proximity switch T3H*

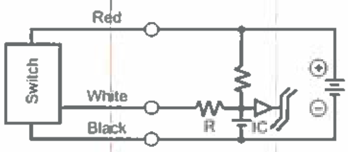
Output circuit protection

When an inductive load (relay or solenoid valve) is connected, be sure to install the protection circuit shown below in order to protect from the surge voltage generated when the switch is turned OFF.



Example of surge absorbing element (diode) jointly used as the inductive load. Use Hitachi diode VO6 or equivalent

When a capacitive load (condenser) is connected, be sure to install the protection circuit shown below in order to protect from the inrush current generated when the switch is turned ON.

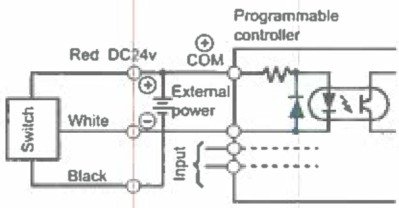


Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0.10 = R (Ω)

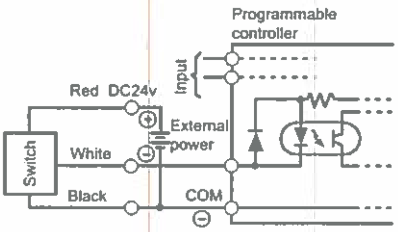
Connection to programmable controller (sequencer)

The connecting method differs according to the type of programmable controller.

Make connections as shown below.



Example of switch T3H3 connection to source input (external power) type.



Example of switch T3H3 connection to source input (built - in power) type.
The switch cannot be connected to the sink input sequencer.

Reed switch T0H*

Magnetic environment

Avoid using at places with strong magnetic field and high current (large magnet, spot welder, etc.) in the surroundings. When making proximity connection of cylinders with switches in parallel, the magnetic substance moving at the vicinity of the cylinder may cause mutual interference, affecting the detecting accuracy.

Lead wire connection

Be sure to connect the lead wire of the switch to a load in series, instead of connecting it directly to the power source.

A For DC, white wire is the positive (+) side and the black wire the negative (-) side.
If connected inverse, the switch activates, but the lamp fails to light.

B To connect the lead wire to an AC relay or input terminal of the programmable controller , the lamp of the switch may not light if each circuit is half-wave rectification. In such cases reverse the polarity of the connection, then the lamp will light.

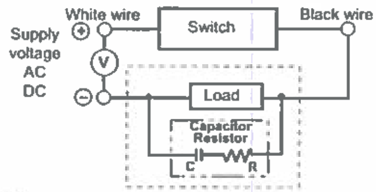
Contact capacity

Avoid using the load with the capacity exceeding the maximum contact capacity of the switch. When the current is below the rated current level, the switch lamp may fail to light.

Contact protection

When using for the inductive load (such as relay, etc.), be sure to install the contact protection circuits shown below.

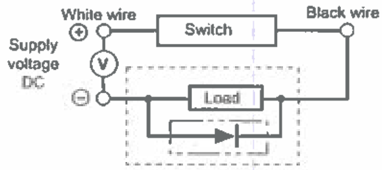
- When using capacitor and resistance



Wired by user

Protection circuit (spark quenching circuit)
Recommended value capacitor C 0.033 - 0.1µF
Resistor R 1 - 3KΩ
By Okaya Denki XEBIKI or equivalent

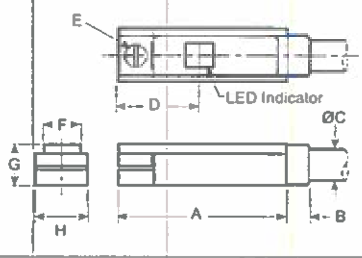
- When using diode



Wired by user   *Protection General rectifier diode By Hitachi V06 or equivalent*

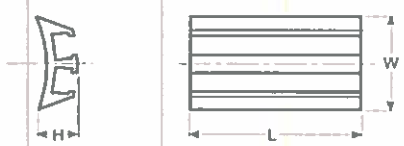
6. Installation dimensions in mm

Switches



Model code	A	B	C	D	E	F	G	H
T3H3	18.5	2.5	3.4	9	M2.5	4.5	4.7	6
T0H3	22.5	2.5	3.4	9	M2.5	4.5	4.7	6

Mounting rail



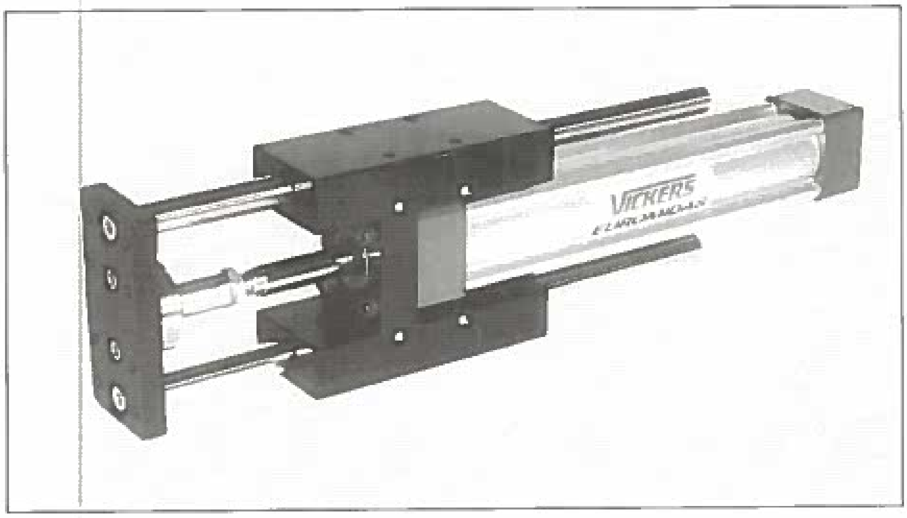
Model code	H	L	W
C032 - 67K	10	45	25
C040 - 67K	10	45	25.5
C050 - 67K	9	45	26
C063 - 67K	8.5	45	26.5
C080 - 67K	7	45	27
C100 - 67K	7	45	27

Note: Switch mounting rails are supplied as pair complete with cleaning pad.

FITTING NOTE: Using cleaning pad provided, throughly clean area of cylinder barrel where rails are to be fitted.
Remove protective backing from underside of rail and firmly press into place on barrel.

EUROMIDAS Rod guided power cylinders

Double acting - CG series
32, 40, 50, 63, 80, 100mm bore



1. General description and application benefits

A range of double acting, roller bearing 'H' section rod guided cylinders based on the fully adjustable cushioned EUROMIDAS range of metric cylinders to VDMA, and ISO standards. Also conforms to Volkswagen / Audi automotive standard.

- Innovative design.
- Roller bearing rod guides ensure smooth operation.
- High resistance to side loads.
- High non rotating accuracy.
- Magnetic piston standard.
- Small switches fit within rail mounting directly to cylinder barrel.
- Side or bottom mounting positions.
- High accuracy due to long guide length.
- Flexible coupling between guide and piston rod.
- Non standard strokes available.

2. Functional symbol

3. Preferred model selection

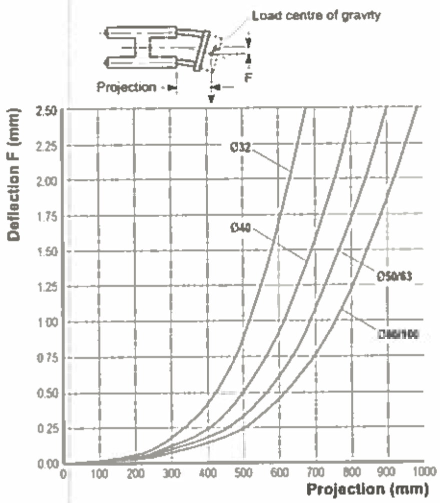
Bore	Model code	Stroke 25	50	80	100	125	160	200	250	320
32mm	CG0321DxStroke	■	■	■	■	■	■	■	■	■
40mm	CG0401DxStroke	■	■	■	■	■	■	■	■	■
50mm	CG0501DxStroke	■	■	■	■	■	■	■	■	■
63mm	CG0631DxStroke	■	■	■	■	■	■	■	■	■
80mm	CG0801DxStroke	■	■	■	■	■	■	■	■	■
100mm	CG1001DxStroke	■	■	■	■	■	■	■	■	■

Non standard strokes available. Maximum stroke 1200mm.

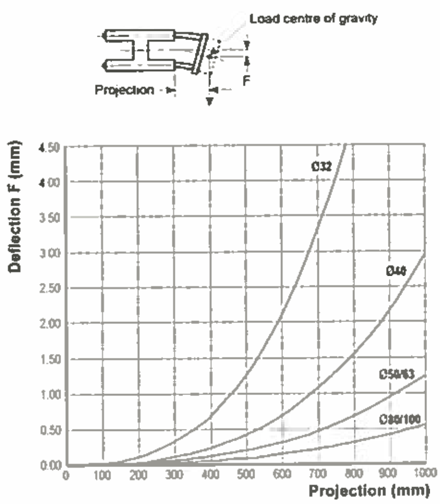
Ordering example:- CG0401Dx100 = 40mm bore double acting rod guided cylinder x 100mm stroke.

4. Technical data

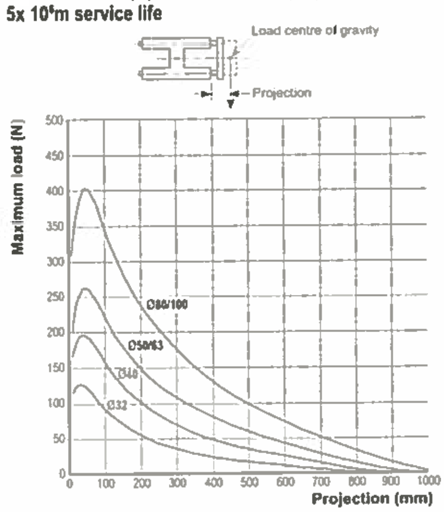
Deflection of the extension unit - due to own load



Deflection of the extension unit - due to load of 10N



Maximum load (N) as a function of projection for 5x 10⁶m service life



5. Operating data

Standards	ISO 6431 VDMA BSI CETOP
Operating pressure	1.0 - 10 bar (14.5 - 145 psig)
Ambient operating temperature range	-20° C to + 75° C (-4°F to + 158° F)
Materials of construction	Cylinder: Barrel - Hard anodised aluminium alloy Piston rod - Stainless steel Piston -Aluminium End covers - Aluminium alloy, hard epoxy coated. Seals - Polyurethane Rod guide: Body - Black anodised aluminium alloy End plate - Black anodised aluminium alloy Guide rods - Hard chromed stainless steel
Cushioning	Fully adjustable air cushioning at both ends
Cushioning length	32mm bore cylinders - 15mm 40mm bore cylinders - 12mm 50mm bore cylinders - 14mm 63mm bore cylinders - 14mm 80mm bore cylinders - 20mm 100mm bore cylinders - 22mm
Type of connection	Screwthread
Port size	1/4" BSP - 1/2" BSP
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG 37 mineral oil.

Piston rod thrust (N)

	Air pressure (bar)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
32mm bore	OUT	64	128	192	256	320	384	448	512	576	640
	IN	55	110	165	220	275	330	385	440	495	550
40mm bore	OUT	100	200	300	400	500	600	700	800	900	1000
	IN	84	168	252	336	420	504	588	672	756	840
50mm bore	OUT	157	314	471	628	785	942	1099	1256	1413	1570
	IN	132	264	396	528	660	792	924	1056	1188	1320
63mm bore	OUT	249	498	747	996	1245	1494	1743	1992	2241	2490
	IN	224	448	672	896	1120	1344	1568	1792	2016	2240
80mm bore	OUT	402	804	1206	1608	2010	2412	2814	3216	3618	4020
	IN	362	724	1086	1448	1810	2172	2534	2896	3258	3620
100mm bore	OUT	628	1256	1884	2512	3140	3768	4396	5024	5652	6280
	IN	589	1178	1767	2356	2945	3534	4123	4712	5301	5890

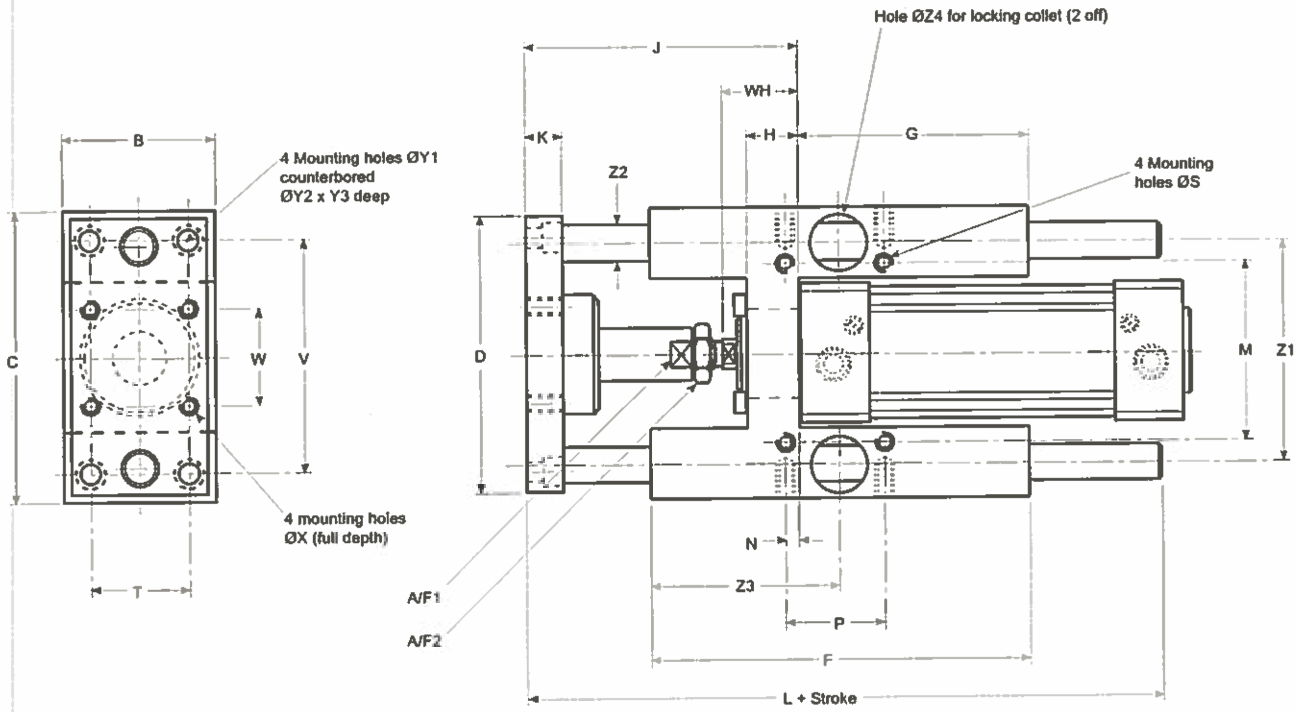
N = Piston rod thrust in Newtons assuming a cylinder efficiency of 80%.

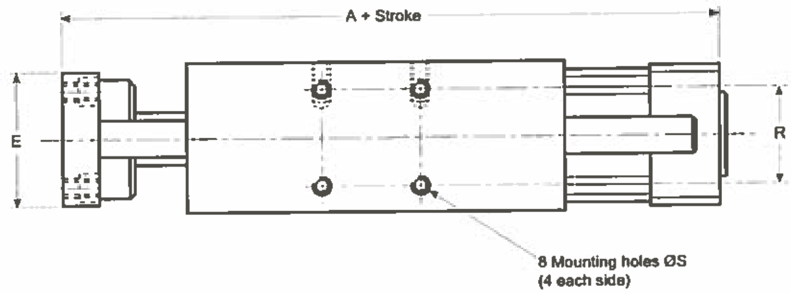
Installation dimensions	Basic cylinders - See page CG 1.3 Magnetic sensors - See page CG 2.1
Mass - Basic cylinders (Zero stroke)	CG0321Dx*** 1.811kg + 0.074kg per 25mm stroke CG0401Dx*** 3.111kg + 0.112kg per 25mm stroke CG0501Dx*** 5.072kg + 0.174kg per 25mm stroke CG0631Dx*** 6.575kg + 0.185kg per 25mm stroke CG0801Dx*** 11.620kg + 0.328kg per 25mm stroke CG1001Dx*** 14.880kg + 0.378kg per 25mm stroke
Mountings	For additional mountings see pages EM 3.1-2 of EUROMIDAS catalogue ref GB-P5002-EM
Magnetic sensors	See page CG 2.1
Service kits	CG0321Dx*** Series KC228 Mass 0.04kg CG0401Dx*** Series KC229 Mass 0.05kg CG0501Dx*** Series KC230 Mass 0.15kg CG0631Dx*** Series KC231 Mass 0.16kg CG0801Dx*** Series KC232 Mass 0.18kg CG1001Dx*** Series KC233 Mass 0.20kg

VICKERS

Pneumatics

6. Installation dimensions in mm





Bore	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
32	183	50	97	90	45	125	76	17	89	12	177	61	4.3	32.5	32.5	M6 x 12 deep
40	204	58	115	110	54	140	81	21	99	12	192	69	11.0	38.0	38.0	M6 x 12 deep
50	220	70	137	130	63	150	79	26	114	15	237	85	18.8	46.5	46.5	M8 x 16 deep
63	235	85	152	145	80	182	111	26	114	15	237	100	15.3	56.5	56.5	M8 x 16 deep
80	263	105	189	180	100	215	128	34	135	20	280	130	21.0	72.0	72.0	M10 x 20 deep
100	278	130	213	200	120	220	128	39	140	20	280	150	24.5	89.0	89.0	M10 x 20 deep

Bore	T	V	W	WH	X	Y1	Y2	Y3	Z1	Z2	Z3	Z4	A/F1	A/F2
32	32.5	78	32.5	26	M6	6.6	11	6.5	74	12	61	20	13	17
40	38.0	84	38.0	30	M6	6.6	11	6.5	87	16	67	24	15	19
50	46.5	100	46.5	37	M8	9.0	15	9.0	104	20	75.5	32	22	24
63	56.5	105	56.5	37	M8	9.0	15	9.0	119	20	84	38	22	24
80	72.0	130	72.0	46	M10	11.0	18	11.0	148	25	102	38	27	30
100	89.0	150	89.0	51	M10	11.0	18	11.0	172	25	111	38	27	30

Notes:

1) For dimensional details of EUROMIDAS cylinders see page EM 1.3 of catalogue ref GB-P5002-EM.
2) Lubrication of roller bearings (via locking collet holes) should be carried out every 5000km of distance travelled.
3) Unit is supplied with locking collet holes plugged to prevent ingress of foreign particles.
4) For details of rod locking (collet) system contact Customer Services Department.

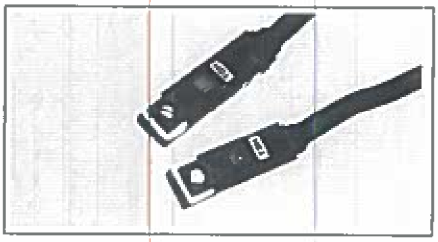
VICKERS

Pneumatics

EUROMIDAS Rod guided power cylinders

Magnetic sensors - Reed switch Type T0H and Proximity switch Type T3H

⌀ 32, 40, 50, 63, 80, 100mm



1. General description and application benefits

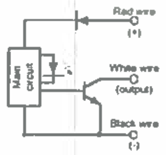
Continuously rated reed and proximity switches with LED indicator and flying lead. Programmable controller relay operation.

- Switches fit within cylinder body envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagrams of switches

Reed switch T0H*

Proximity switch T3H*



3. Preferred model selection

Reed switch

Model code	Description
T0H3	Axial lead wire reed switch with 3metre flying lead (Standard)
T0H5	Axial lead wire reed switch with 5 metre flying lead (Optional)

Proximity switch

Model code	Description
T3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
T3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

Switch mounting rail (pair)

Model code	Description	Model code	Description
C032 - 67K	For 32mm bore cylinders	C063 - 67K	For 63mm bore cylinders
C040 - 67K	For 40mm bore cylinders	C080 - 67K	For 80mm bore cylinders
C050 - 67K	For 50mm bore cylinders	C100 - 67K	For100mm bore cylinders

4. Operating data

Ambient operating temperature range	-10° C to + 60° C (14 F to + 140° F)	
Load voltage/current	T0H - 12, 24vDC / 5 to 50mA 110vAC / 7 to 20mA T3H - 30vDC or less / 100mA or less	
Power consumption	T3H - 24vDC (ON) 10mA or less	
Leakage current	T3H - 10 µA or less	
Maximum impulse	T0H - 30G	T3H - 100G
Protection	IEC standard IP67	
Lead wire	T0H - Oil proof 2 core vinyl cabtyre cord 0.2mm² T3H - Oil proof 3 core vinyl cabtyre cord 0.2mm²	
Insulation resistance	More than 20MΩ at 500v DC megger	
LED indication	Red (ON)	

5. Installation requirements

Reed switch T0H*

Magnetic environment

Avoid using at places with strong magnetic field and high current (large magnet, spot welder, etc.) in the surroundings. When making proximity connection of cylinders with switches in parallel, the magnetic substance moving at the vicinity of the cylinder may cause matual interference, affecting the detecting accuracy.

Lead wire connection

Be sure to connect the lead wire of the switch to a load in series, instead of connecting it directly to the power source.

[A] For DC, white wire is the positive (+) side and the black wire the negative (-) side.
If connected inverse, the switch activates, but the lamp fails to light.

[B] To connect the lead wire to an AC relay or input terminal of the programmable controller , the lamp of the switch may not light if each circuit is half-wave rectification. In such cases reverse the polarity of the connection, then the lamp will light.

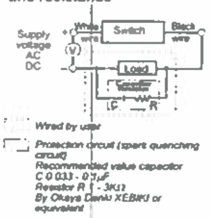
Contact capacity

Avoid using the load with the capacity exceeding the maximum contact capacity of the switch. When the current is below the rated current level, the switch lamp may fail to light.

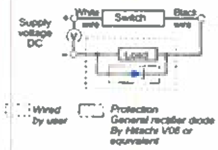
Contact protection

When using for the inductive load (such as relay, etc.), be sure to install the contact protection circuits shown below.

When using capacitor and resistance

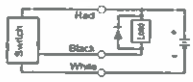


When using diode



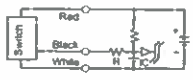
Proximity switch T3H*

Output circuit protection



Example of surge absorbing element (diode) jointly used as the inductive load. Use Hitachi diode V06 or equivalent

When an inductive load (relay or solenoid valve) is connected, be sure to install the protection circuit shown left in order to protect from the surge voltage generated when the switch is turned OFF.

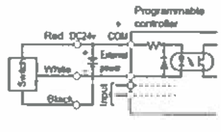


Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0 10 = R (Ω)

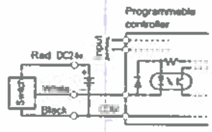
When a capacitive load (condenser) is connected, be sure to install the protection circuit shown left in order to protect from the inrush current generated when the switch is turned ON.

Connection to programmable controller (sequencer)

The connecting method differs according to the type of programmable controller.
Make connections as shown below.



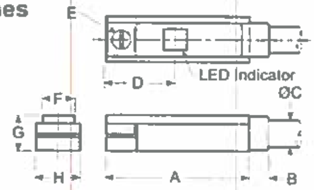
Example of switch K3H connection to source input (external power) type*



Example of switch K3H connection to source input (built - in power) type. The switch cannot be connected to the sink input sequencer*

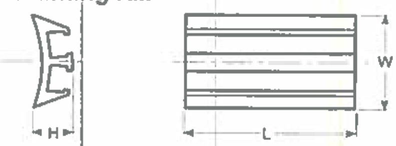
6. Installation dimensions in mm

Switches



Model code	A	B	C	D	E	F	G	H
T0H3	22.5	2.5	3.4	9	M2.5	4.5	4.7	6
T3H3	18.5	2.5	3.4	9	M2.5	4.5	4.7	6

Mounting rail



Note: Switch mounting rails are supplied as pair complete with cleaning pad.

Model code	H	L	W	Model code	H	L	W
C032 - 67K	10	45	25	C063 - 67K	8.5	45	26.5
C040 - 67K	10	45	25.5	C080 - 67K	7	45	27
C050 - 67K	9	45	26	C100 - 67K	7	45	27

FITTING NOTE:
Using cleaning pad provided, throughly clean area of cylinder barrel where rails are to be fitted.
Remove protective backing from underside of rail and firmly press into place on barrel.

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

Printed in Great Britain

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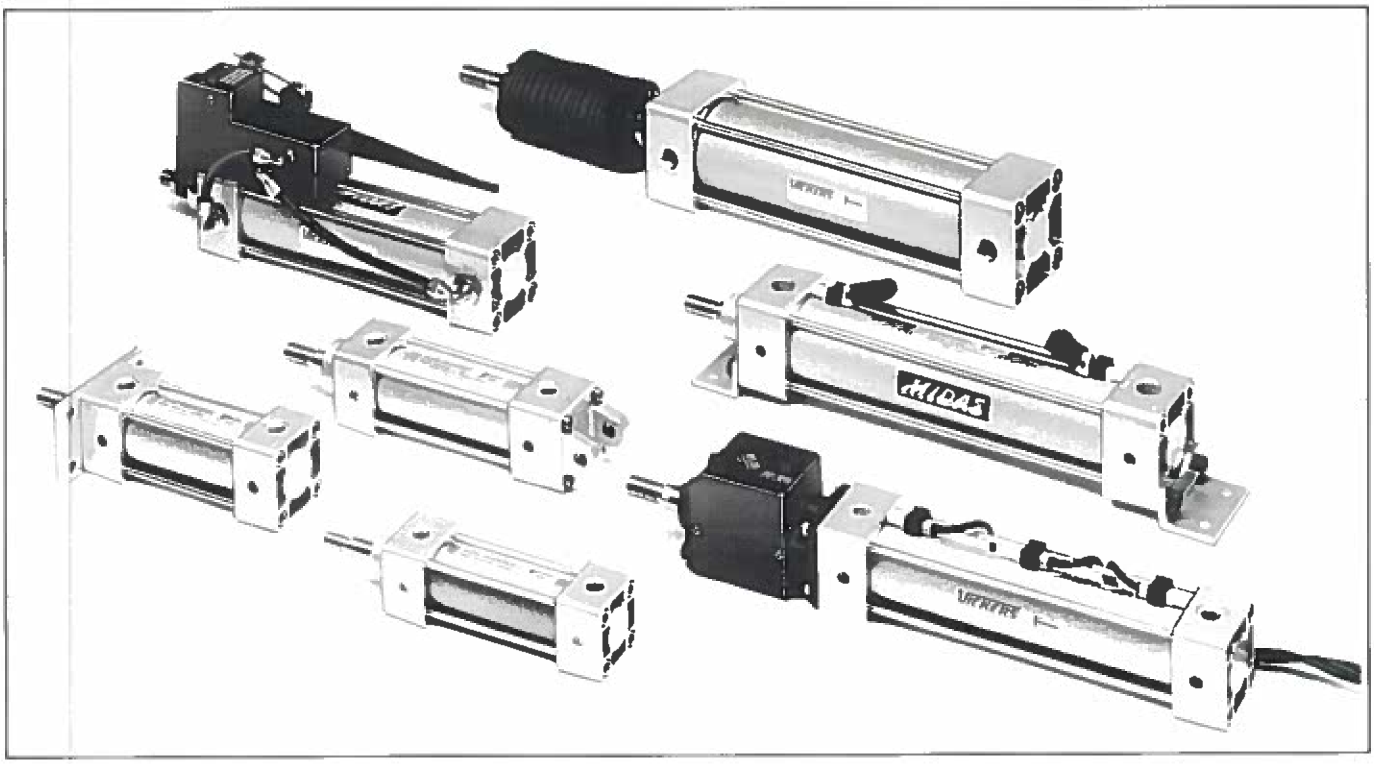
ISO 6431 Power cylinders

Double acting - MZ Series - MIDAS II
32, 40, 50, 63, 80, 100mm bore



1. General description and application benefits

A range of double acting, single rod and through rod fully adjustable cushioned metric cylinders to ISO 6431, CETOP RP43P and RP53P, BS4862: 1973 and BS 4862 Part 2: 1983 standards.

- Simple reliable design
- Conforms to ISO 6431 and CETOP standards
- Lube for life

  Note: *If cylinder is lubricated in first instance this must be continued*
- Long seal life
- Magnetic piston option
- Non magnetic piston
- Adjustable air cushioning (32mm bore – Buffered cushioning)
- Full range of mounting accessories
- Standard strokes 25 – 320mm

2. Functional symbols

MZ*0321ND x *****

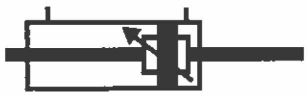
Basic and high temperature cylinder

MZ**1DD** x *****

Basic and high temperature cylinder

MZ**4DD** x *****

Through rod cylinder

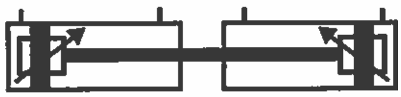


MZ**5DD ** x *** x *****

Rear connection cylinder

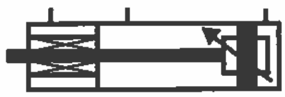
MZ**6DD** x *** x *****

Front connection cylinder



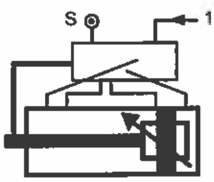
MZS*1DD x *****

Braking cylinder



MZ**9*D ** x *****

Positioner controlled cylinder



3. Model code – cylinders

M Z *	* * *	*	*	D	* *	*	x	* * *
1	2	3	4	5	6	7		8

[1] Range
MZ = Lang Midas non magnetic range
MZE = Lang Midas magnetic range for solid state/reed switch operation
MZS = Braking cylinder

[2] Cylinder bore
032 = 32mm
040 = 40mm
050 = 50mm
063 = 63mm
080 = 80mm
100 =100mm

[3] Function
1 = Double acting
4 = Double acting with rod through both ends
5 = Double acting rear connection twin cylinders
6 = Double acting front connection twin cylinders
9 = Double acting fitted with positioner unit

[4] Type of cylinder
D = Double cushioned air cylinder
K = Fitted with Kent positioner unit (80 – 100mm bore)
L = Fitted with compact positioner unit (32 – 100mm bore)
N = Non cushioned air cylinder (buffered)

[5] Materials of construction

[6] Special features
G = Gaitered
MT = Centre trunnion (MT4 type)
CE = Cam extends with increase in signal pressure
CR = Cam retracts with increase in signal pressure
VA = Viton seals

***Note:** 1) CE/CR only apply to compact positioner – code L in position [4]*

[7] Stroke range letter for gaitered cylinders
A = 0 – 100mm
B = 101 – 200mm
C = 201 – 300mm
D = 301 – 400mm
E = 401 – 500mm
F = 501 – 600mm
G = 601 – 700mm
H = 701 – 800mm
J = 801 – 900mm
K = 901 – 1000mm

[8] Stroke
Standard strokes:-
25 = 25mm
50 = 50mm
80 = 80mm
100 = 100mm
125 = 125mm
160 = 160mm
200 = 200mm
250 = 250mm
320 = 320mm

***Notes:** 1) Other non standard strokes available to special order*
2) For twin cylinders state both strokes ie x100x100

Preferred model selection

The products listed represent the standard product range most readily available.
Non standard strokes available to special order.

Cylinders with non magnetic piston

	Stroke	25	50	80	100	125	160	200	250	320
MZ0321ND x Stroke	32mm bore cylinder	■	■	■	■	■	■	■	■	■
MZ0401DD x Stroke	40mm bore cylinder	■	■	■	■	■	■	■	■	■
MZ0501DD x Stroke	50mm bore cylinder	■	■	■	■	■	■	■	■	■
MZ0631DD x Stroke	63mm bore cylinder	■	■	■	■	■	■	■	■	■
MZ0801DD x Stroke	80mm bore cylinder	■	■	■	■	■	■	■	■	■
MZ1001DD x Stroke	100mm bore cylinder	■	■	■	■	■	■	■	■	■

Cylinders with magnetic piston

Cylinders supplied with magnetic pistons for operation of solid state switches (see page MZ 5.1) or reed switches (see page MZ 5.2)

	Stroke	25	50	80	100	125	160	200	250	320
MZE0321ND x Stroke	32mm bore cylinder	■	■	■	■	■	■	■	■	■
MZE0401DD x Stroke	40mm bore cylinder	■	■	■	■	■	■	■	■	■
MZE0501DD x Stroke	50mm bore cylinder	■	■	■	■	■	■	■	■	■
MZE0631DD x Stroke	63mm bore cylinder	■	■	■	■	■	■	■	■	■
MZE0801DD x Stroke	80mm bore cylinder	■	■	■	■	■	■	■	■	■
MZE1001DD x Stroke	100mm bore cylinder	■	■	■	■	■	■	■	■	■

Typical model codes

MZ1001DD x 320 = 100mm bore cylinder with non magnetic piston
Double acting, double cushioned
320mm stroke

MZE0401DD x 100 = 40mm bore cylinder fitted with magnetic piston
Double acting, double cushioned
100mm stroke

Model code – Options

For model codes relating to cylinders with optional functions, types and/or special features as detailed on page MZ 1.2 see relevant pages (MZ 2.1 – MZ 2.9)
These models are available to special order.

Model code – Mountings

Front and rear flanges – see page MZ 3.1
Rear clevis – see page MZ 3.1
Rear eye – see page MZ 3.2
Feet – see page MZ 3.2
Centre trunnion – see page MZ 3.3

Model code – Accessories

Fork end – see page MZ 4.1
Rod spherical bearing – see page MZ 4.1
Pivot pin – see page MZ 4.2
Piston rod locknut – see page MZ 4.2

Model code – Magnetic sensors and tie rod clamps

Solid state switch – see page MZ 5.1
Reed switch – see page MZ 5.2

4. Operating data

Standards	ISO 6431 CETOP RP 43P and RP 53P BS4862: 1973 and BS4862 Part 2: 1983
Operating pressure range	1.0 to 10 bar (14.5 to 145 psig)
Ambient operating temperature range	– 20°C to +75°C (– 4°F to +158°F)
Materials of construction	Barrel – Anodised aluminium Piston rod – Stainless steel Piston – Aluminium End covers – Aluminium alloy, epoxy polyester painted Seals – Polyurethane
Cushioning	Fully adjustable air cushioning at both ends (see note)
Cushioning length	32mm bore cylinders – Buffered 40mm bore cylinders – 12mm 50mm bore cylinders – 13mm 63mm bore cylinders – 14mm 80mm bore cylinders – 20mm 100mm bore cylinders – 22mm
Type of connection	Screwthread
Port sizes	1/4" BSP – 1/2" BSP
Operating medium	Compressed air, filtered and non lubricated or lubricated. If installed in lubricated system use ISO VG37 mineral oil.
Cylinder sizing selection and air consumption	See pages MZ 1.5-6
Installation dimensions	Basic cylinders and options – see pages MZ 1.7, MZ 2.1-9 Cylinders with mountings – see pages MZ 3.1-3 Cylinder Accessories – see pages MZ 4.1-2 Magnetic sensors – see pages MZ 5.1-2
Mass (Standard cylinders)	MZ0321ND x*** 0.595kg + 0.100kg per 25mm stroke MZ0401DD x*** 0.700kg + 0.125kg per 25mm stroke MZ0501DD x*** 1.220kg + 0.150kg per 25mm stroke MZ0631DD x*** 1.840kg + 0.175kg per 25mm stroke MZ0801DD x*** 2.960kg + 0.200kg per 25mm stroke MZ1001DD x*** 4.155kg + 0.250kg per 25mm stroke MZE0321ND x*** 0.600kg + 0.100kg per 25mm stroke MZE0401DD x*** 0.705kg + 0.125kg per 25mm stroke MZE0501DD x*** 1.225kg + 0.150kg per 25mm stroke MZE0631DD x*** 1.845kg + 0.175kg per 25mm stroke MZE0801DD x*** 3.000kg + 0.200kg per 25mm stroke MZE1001DD x*** 4.150kg + 0.250kg per 25mm stroke
Mass (standard options)	Through rod cylinders – as above + addition as shown on page MZ 2.1 Rear connection twin cylinders – as above + addition as shown on page MZ 2.1 Front connection twin cylinders – as above + addition as shown on page MZ 2.2 High temperature cylinders – as standard cylinders above Gaitered cylinders – as above + addition as shown on page MZ 2.3 Braking cylinders – as above + addition as shown on page MZ 2.4 Cylinders with positioner unit (code L) – as above + addition as shown on page MZ 2.8 Cylinders with positioner unit (code K) – as above + addition as shown on page MZ 2.9
Selection of related equipment	See page MZ 1.8
Mountings	See pages MZ 3.1-3
Accessories	See pages MZ 4.1-2
Magnetic sensors	See pages MZ 5.1-2
Service kits	MZ*0321ND x*** Series KC 196 Mass 0.04kg MZ*0401DD x*** Series KC 181 Mass 0.05kg MZ*0501DD x*** Series KC 182 Mass 0.15kg MZ*0631DD x*** Series KC 183 Mass 0.16kg MZ*0801DD x*** Series KC 184 Mass 0.18kg MZ*1001DD x*** Series KC 185 Mass 0.20kg

5. Cylinder sizing and useful cylinder calculations

Selection of suitable bore size

1. Establish thrust required and working pressure available. Determine whether static or dynamic application at this stage. For dynamic applications it is recommended that a thrust of 30% in excess of required loading be allowed.
2. Select working pressure on top of table below.
3. Select force required by reading down from selected working pressure. If exact force is not shown use nearest larger unit.
4. Read off cylinder bore size on left of table.

Piston thrust chart

Thrust in Newtons assuming a cylinder efficiency of 80%

Bore diameter mm	Piston area dm^2	Air pressure – bar 1	2	3	4	5	6	7	8	9	10
32	out 0.0804	64	128	192	256	320	384	448	512	576	640
	in 0.0691	55	110	165	220	275	330	385	440	495	550
40	out 0.1256	100	200	300	400	500	600	700	800	900	1000
	in 0.1055	84	168	252	336	420	504	588	672	756	840
50	out 0.1963	157	314	471	628	785	942	1099	1256	1413	1570
	in 0.1649	132	264	396	528	660	792	924	1056	1188	1320
63	out 0.3117	249	498	747	996	1245	1494	1743	1992	2241	2490
	in 0.2803	224	448	672	896	1120	1344	1568	1792	2016	2240
80	out 0.5026	402	804	1206	1608	2010	2412	2814	3216	3618	4020
	in 0.4535	362	724	1086	1448	1810	2172	2534	2896	3258	3620
100	out 0.7854	628	1256	1884	2512	3140	3768	4396	5024	5652	6280
	in 0.7363	589	1178	1767	2356	2945	3534	4123	4712	5301	5890

Useful cylinder calculations

THRUST

$T = P \times A \times 10^3$

T = Thrust (Newtons)
P = Pressure (bar)
A = Effective piston area (dm^2)

This calculation must be reduced by 20% to allow for internal friction within the cylinder. For dynamic application it is recommended that a thrust of 30% in excess of required loading be allowed.

AIR CONSUMPTION

$$C = \frac{A \times L \times N \times (P+101.3)}{101.3}$$

C = Air consumption (dm^3/sec)
A = Effective piston area (dm^2)
L = Stroke (mm)
N = Number of single strokes per second
P = Pressure (bar gauge)

AIR FLOW

$$Q = \frac{A \times L \times (P+101.3)}{T \times 101.3}$$

Q = Air flow (dm^3/sec) free air
A = Effective piston area (dm^2)
L = Stroke (mm)
T = Time to complete single stroke (secs)
P = Pressure (bar gauge)

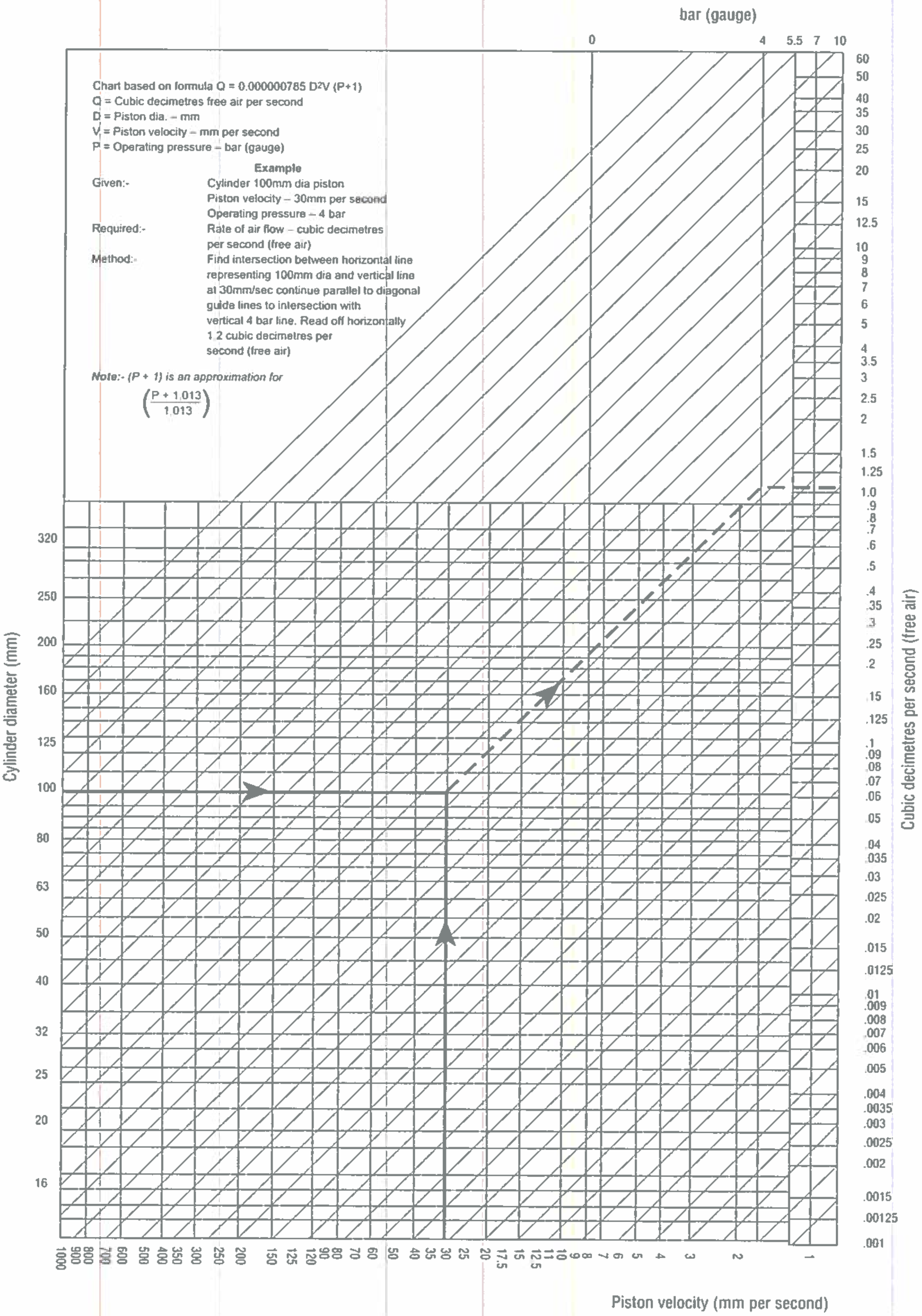
Useful conversions

1N = 0.102 kgf
1N = 0.225 lbf
1kgf = 0.807 N

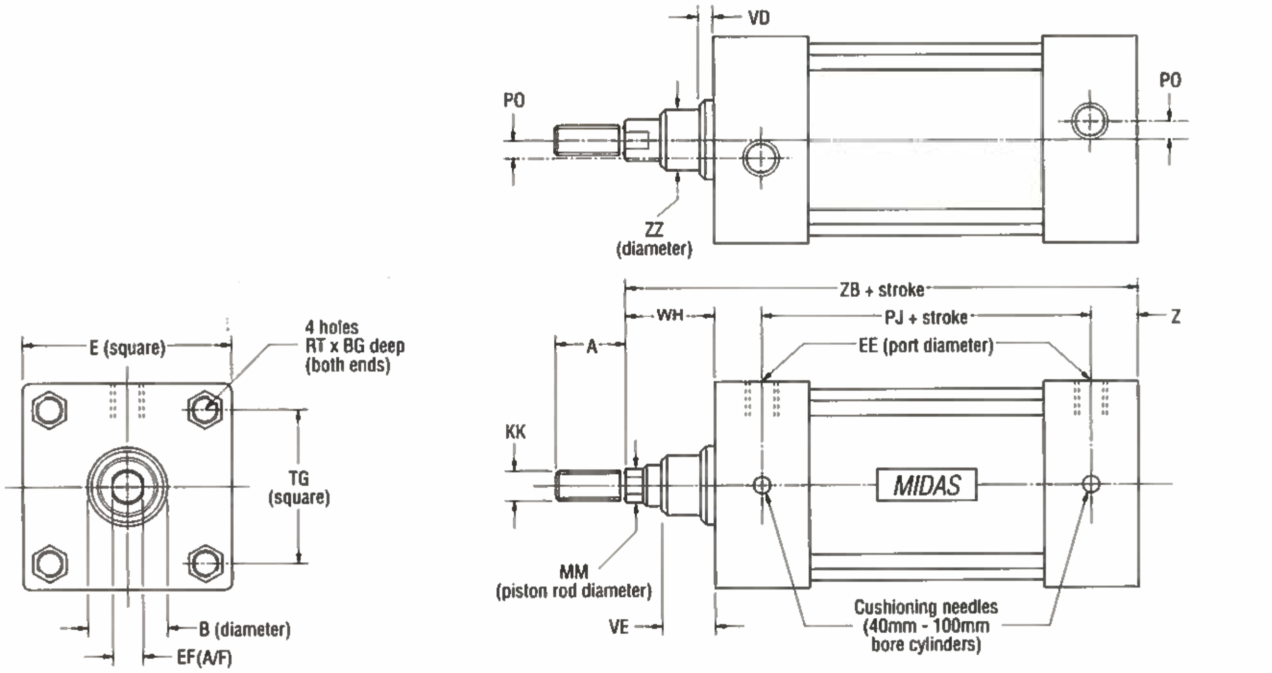
1lbf = 0.454 kgf
1scfm = 0.472 dm^3/sec
1psi = 0.069 bar
60 l/min = 1dm^3/sec

1kg/cm^2 = 0.981 bar
14.5 psi = 1 bar
1 bar = 10^5 Pa

6. Cylinder air consumption chart



7. Installation dimensions in mm



Bore	A	B	BG	E	EE	EF	KK	MM	PJ
32	20	0	10	45	G1/8"	11	M10 x 1.25	12	56
40	24	35	12	58	G1/4"	13	M12 x 1.25	16	68
50	32	45	12	69	G1/4"	17	M16 x 1.50	20	68
63	32	45	18	82	G1/2"†	17	M16 x 1.50	20	75
80	40	50	18	102	G1/2"†	22	M20 x 1.50	25	85
100	40	50	22	122	G1/2"	22	M20 x 1.50	25	87

Bore	PO	RT	TG	VD	VE	WH	Z	ZB	ZZ
32	4	M5 x 0.80	32.5	0	0	26	19	120	0
40	0	M6 x 1.00	39.6	3	21	30	18.5	135	32
50	0	M6 x 1.00	49.5	7	29	35	21	145	40
63	0	M8 x 1.25	58	7	29	37	23	158	40
80	0	M8 x 1.25	74.2	7	29	42	25.5	178	45
100	0	M10 x 1.50	89.1	7	29	50	26.5	190	45

† EE dimension conforms to BS standard only – if required to ISO or CETOP standard (i.e. EE = G3/8") please specify on order

***Note:** Piston rod locknuts are not supplied as standard – please order separately (see page MZ 4.2)*

8. Ordering procedure

Basic cylinders only:-
Order in accordance with model codes shown on page MZ 1.3

Through rod cylinders:-
Available to special order in accordance with model codes shown on page MZ 2.1

Rear connection cylinders:-
Available to special order in accordance with model codes shown on page MZ 2.1

Front connection cylinders:-
Available to special order in accordance with model codes shown on page MZ 2.2

High temperature cylinders:-
Available to special order in accordance with model codes shown on page MZ 2.2

Gaitered cylinders:-
Available to special order in accordance with model codes shown on page MZ 2.3

Braking cylinders:-
Available to special order in accordance with model codes shown on page MZ 2.4

Cylinders complete with positioner unit:-
Available to special order in accordance with model codes shown on pages MZ 2.8-9

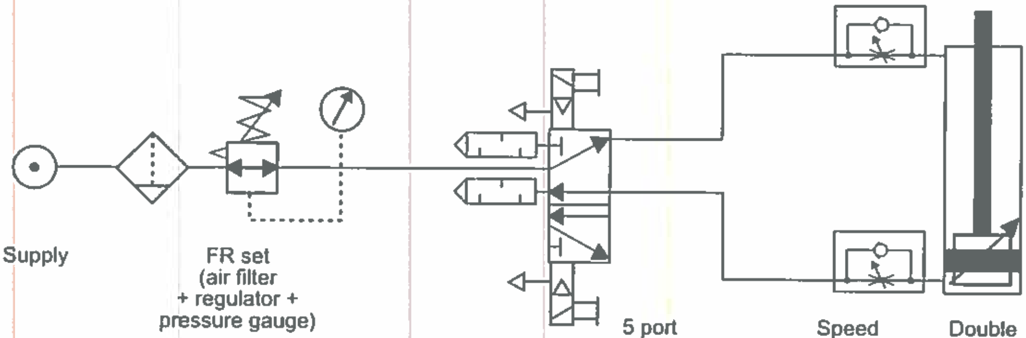
Cylinder mountings:-
Mountings must be ordered separately in accordance with model codes shown on pages MZ 3.1-2

Cylinders complete with centre trunnion mounting:-
Available to special order in accordance with model codes shown on page MZ 3.3

Cylinder accessories:-
Must be ordered separately in accordance with model codes shown on pages MZ 4.1-2

Magnetic sensors:-
Magnetic sensors and tie rod clamps must be ordered separately in accordance with model codes shown on pages MZ 5.1-2

9. Basic pneumatic circuit diagram



10. Selection of related equipment

Select the equipment to suit the cylinder bore and speed in accordance with table below – see relevant catalogues for details of product and ordering codes. All solenoid valves can be free standing or manifold mounted.

Cylinder bore	Theoretical speed (mm/sec)	Required flow rate (dm^3/sec) at 6.3 bar	Solenoid valve		Speed controller	Silencer
			Single solenoid	Double solenoid		
32	300	2	4KA110	4KA120	SC3G-M5-4,6	PSPM5
	300	2	4KB110	4KB120	SC3G-8-6,8	PSP13
	>500	5	VS-10G5B1-51	VS-10G5B1-53	SC3G-8-6,8	PSP13
	>500	5	VS16/51 (ISO 1)	VS16/53 (ISO 1)	SC3G-8-6,8	PSP13
40	300	3.5	4KA110	4KA120	SC3G-M5-4,6	PSPM5
	300	3.5	4KB110	4KB120	SC3G-8-6,8	PSP13
	>500	7	VS-10G5B1-51	VS-10G5B1-53	SC3G-8-6,8	PSP13
	>500	7	VS16/51 (ISO 1)	VS16/53 (ISO 1)	SC3G-8-6,8	PSP13
50	300	5	4KA210	4KA220	SC3G-8-6,8	PSP13
	300	5	4KB210	4KB220	SC3G-8-6,8	PSP13
	>500	8	VS-08P5B1-51	VS-08P5B1-53	SC3G-8-6,8	PSO8P
	>500	8	VS16/51 (ISO 1)	VS16/53 (ISO 1)	SC3G-8-6,8	PSP13,25
63	400	12	4KA210	4KA220	SC3G-8-6,8	PSP13
	400	12	4KB210	4KB220	SC3G-8-6,8	PSP13
	>500	14	VS-08P5B1-51	VS-08P5B1-53	SC3G-8-8	PSO8P
	>500	14	VS16/51 (ISO 1)	VS16/53 (ISO 1)	SC3G-8-8	PSP25
	>500	14	VS23/51	VS23/53	SC3G-8-8	PSP25
	>500	14	VS26/51 (ISO 2)	VS26/53 (ISO 2)	SC3G-8-8	PSP25
	>500	14	VT26/51 (ISO 2)	VT26/53 (ISO 2)	SC3G-8-8	PSP25
80	300	12.5	4KA210	4KA220	SC3G-8-6,8	PSP25
	300	12.5	4KB210	4KB220	SC3G-8-6,8	PSP25
	>400	20	VS-08P5B1-51	VS-08P5B1-53	SC3G-8-8	PSO8P
	>400	20	VS16/51 (ISO 1)	VS16/53 (ISO 1)	SC3G-8-6,8	PSP25
	>400	20	VS23/51	VS23/53	SC3G-8-8	PSP25
	>400	20	VS26/51 (ISO 2)	VS26/53 (ISO 2)	SC3G-8-8	PSP25
	>400	20	VT26/51 (ISO 2)	VT26/53 (ISO 2)	SC3G-8-8	PSP25
100	300	20	4KA210	4KA220	SC3G-8-6,8	PSP25
	300	20	4KB210	4KB220	SC3G-8-6,8	PSP25
	300	20	VS-08P5B1-51	VS-08P5B1-53	SC3G-8-8	PSO8P
	300	20	VS16/51 (ISO 1)	VS16/53 (ISO 1)	SC3G-8-8	PSP25
	>400	25	VS23/51	VS23/53	SC3G-8-8	PSP25
	>400	25	VS26/51 (ISO 2)	VS26/53 (ISO 2)	SC3G-8-8	PSP25
	>400	25	VT26/51 (ISO 2)	VT26/53 (ISO 2)	SC3G-8-8	PSP25

Explanation of terms

Theoretical speed – *indicates the degree of cylinder speed, and is approximately equivalent to the speed at no load. The speed decreases considerably when the load is applied.*

Required flow rate – *indicates the instantaneous flow rate at the time the cylinder starts to operate.*

Cylinder options

Double acting through rod cylinders - MZ series
32, 40, 50, 63, 80, 100mm bore

1. Model code

Bore	Model
32	MZ*0324ND x stroke
40	MZ*0404DD x stroke
50	MZ*0504DD x stroke
63	MZ*0634DD x stroke
80	MZ*0804DD x stroke
100	MZ*1004DD x stroke

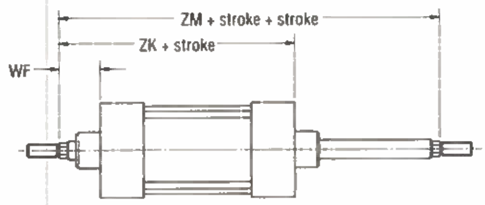
** Note: MZE= Magnetic piston*
MZ = Non magnetic piston

2. Operating data

All operating data is consistent with that for standard cylinders shown on page MZ 1.4

Mass	Mass for standard cylinder as given on page MZ 1.4 plus additional mass shown below		
Service kits	MZ*0324ND x ***	KC 197	Mass 0.05kg
	MZ*0404DD x ***	KC 187	Mass 0.06kg
	MZ*0504DD x ***	KC 188	Mass 0.16kg
	MZ*0634DD x ***	KC 189	Mass 0.17kg
	MZ*0804DD x ***	KC 190	Mass 0.21kg
	MZ*1004DD x ***	KC 191	Mass 0.26kg

3. Installation dimensions in mm and additional mass



Bore	WF	ZK	ZM	Additional mass
32	26	120	146	0.05kg + 0.06kg per 25mm stroke
40	30	135	165	0.16kg + 0.08kg per 25mm stroke
50	35	145	180	0.33kg + 0.13kg per 25mm stroke
63	37	158	195	0.35kg + 0.13kg per 25mm stroke
80	42	178	220	0.61kg + 0.18kg per 25mm stroke
100	50	190	240	0.63kg + 0.18kg per 25mm stroke

4. Ordering procedure

Order in accordance with model codes shown to suit relevant cylinder bore.

Double acting rear connection cylinders - MZ series
32, 40, 50, 63, 80, 100mm bore

1. Model code

Bore	Model
32	MZ*0325ND x stroke x stroke
40	MZ*0405DD x stroke x stroke
50	MZ*0505DD x stroke x stroke
63	MZ*0635DD x stroke x stroke
80	MZ*0805DD x stroke x stroke
100	MZ*1005DD x stroke x stroke

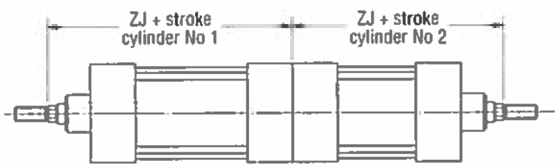
2. Operating data

All operating data is consistent with that for standard cylinders shown on page MZ 1.4

Mass	Sum of mass for each standard cylinder as given on page MZ 1.4

** Note: MZE= Magnetic piston*
MZ = Non magnetic piston

3. Installation dimensions in mm



***Note:** Rear connected cylinders will give 3 or 4 positive positions*

Bore	ZJ
32	120
40	135
50	145
63	158
80	178
100	190

4. Ordering procedure

Order in accordance with model codes shown to suit relevant cylinder bore.

Double acting front connection cylinders - MZ series 32, 40, 50, 63, 80, 100mm bore

1. Model code

Bore	Model
32	MZ*0326ND x stroke x stroke
40	MZ*0406DD x stroke x stroke
50	MZ*0506DD stroke x stroke
63	MZ*0636DD x stroke x stroke
80	MZ*0806DD x stroke x stroke
100	MZ*1006DD x stroke x stroke

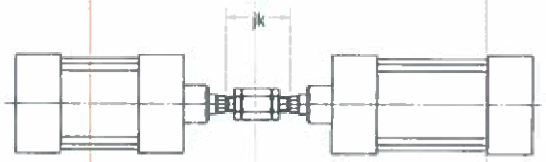
*** Note:** *MZE= Magnetic piston*
MZ = Non magnetic piston

2. Operating data

All operating data is consistent with that for standard cylinders shown on page MZ 1.4

Mass	Mass for each standard cylinder as given on page MZ 1.4 plus mass shown below

3. Installation dimensions in mm and additional mass



***Note:** Front connected cylinders will give 3 or 4 positive positions.*

Bore	jk	Additional mass
32	42	1.25kg + 0.10kg per 25mm stroke
40	49	1.46kg + 0.25kg per 25mm stroke
50	65	2.56kg + 0.30kg per 25mm stroke
63	65	3.80kg + 0.35kg per 25mm stroke
80	81	6.16kg + 0.40kg per 25mm stroke
100	81	8.54kg + 0.50kg per 25mm stroke

4. Ordering procedure

Order in accordance with model codes shown to suit relevant cylinder bore.

Double acting high temperature cylinders - MZ series 32, 40, 50, 63, 80, 100mm bore

1. General description

As standard cylinders (see page MZ 1.1) but fitted with viton seals.

2. Model code

Bore	Model
32	MZ*032*NDVA x stroke
40	MZ*040*DDVA x stroke
50	MZ*050*DDVA x stroke
63	MZ*063*DDVA x stroke
80	MZ*080*DDVA x stroke
100	MZ*100*DDVA x stroke

*** Note:** *MZE= Magnetic piston*
MZ = Non magnetic piston

3. Operating data

Ambient operating temperature range	-20°C to +150°C (-4°F to +300°F) Continous operation

All other operating data is as given for standard cylinders on page MZ 1.4

***Note:** For solid state and reed switches to operate at high temperatures consult Customer Services*

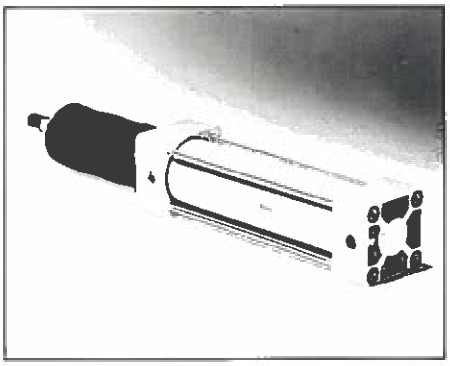
4. Installation dimensions

As for standard cylinders given on page MZ 1.7

5. Ordering procedure

Order in accordance with model codes shown to suit relevant cylinder bore.

Double acting gaitered cylinders - MZ series
40, 50, 63, 80, 100mm bore



1. General description

As standard cylinders (see page MZ 1.1) with stitched neoprene nylon bellows.

2. Model code

Bore	Model
40	MZ*0401DDG† x stroke
50	MZ*0501DDG† x stroke
63	MZ*0631DDG† x stroke
80	MZ*0801DDG† x stroke
100	MZ*1001DDG† x stroke

Note: *† = Stroke range letter – see position* 7 *on page MZ 1.2*
** MZE= Magnetic piston*
MZ = Non magnetic piston

3. Operating data

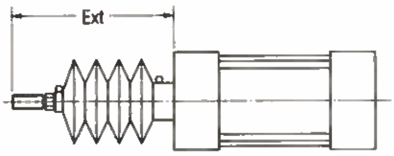
All operating data is consistent with that for standard cylinders shown on page MZ 1.4

Mass	Mass for standard cylinder as given on page MZ 1.4 plus mass shown below

Note: *For gaiters for high temperature cylinders consult Customer Services*

4. Installation dimensions in mm and additional mass

Piston rod extension over standard appears below – all other dimensions as for standard cylinder (see page MZ 1.7)



Bore	Additional mass
40	0.30kg + 0.075kg per 100mm stroke
50	0.30kg + 0.076kg per 100mm stroke
63	0.30kg + 0.080kg per 100mm stroke
80	0.40kg + 0.090kg per 100mm stroke
100	0.40kg + 0.090kg per 100mm stroke

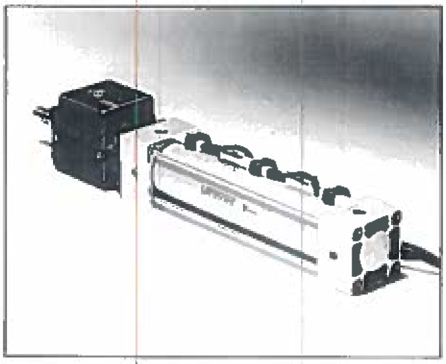
Bore	Stroke range reference letter									
	A	B	C	D	E	F	G	H	J	K
40	28	44	60	76	92	108	124	140	156	172
50	24	32	40	48	56	64	72	80	88	96
63	24	32	40	48	56	64	72	80	88	96
80	24	32	40	48	56	64	72	80	88	96
100	24	32	40	48	56	64	72	80	88	96

5. Ordering procedure

Available to special order in accordance with model codes shown to suit installation requirements and relevant bore and stroke size.

VICKERS

Double acting braing cylinders - MZ series
50, 63, 80mm bore



1. General description and application benefits

Double acting, single rod, fully adjustable cushioned cylinder with mechanical braking system giving intermediate stopping facility.

- Magnetic piston fitted as standard
- Accurate positioning
- Fail safe
- Compact

2. Model code

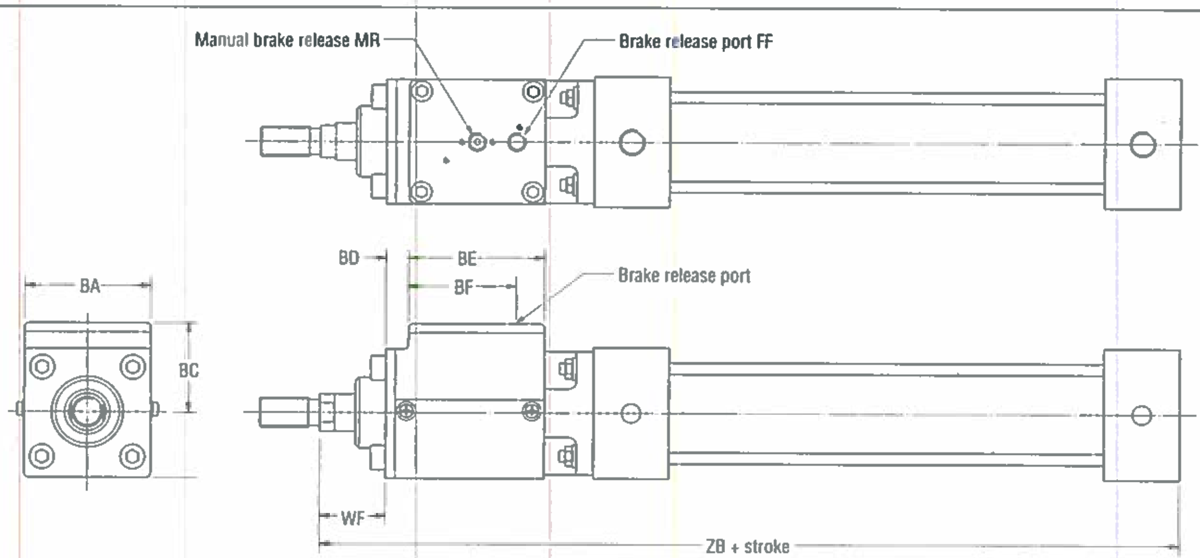
Bore	Model
50	MZS0501DD x stroke
63	MZS0631DD x stroke
80	MZS0801DD x stroke

3. Operating data

Operating pressure range	Cylinder section – 1 to 10 bar (14.5 to 145 psig) Brake section – 3.5 to 10 bar (50 to 145 psig)
Ambient operating temperature range	-20°C to +70°C (-4°F to +158°F)
Stopping precision	± 1mm at cylinder speed of 300mm/sec at no load
Mass	MZS0501DD x *** 3.220kg + 0.150kg per 25mm stroke MZS0631DD x *** 5.040kg + 0.175kg per 25mm stroke MZS0801DD x *** 8.460kg + 0.200kg per 25mm stroke
Mountings	Rear foot, rear flange, rear clevis, rear eye and centre trunnion mountings as for standard cylinders. Front foot and front flange mountings – details on request

All other operating data is as given for standard cylinders on page MZ 1.4

4. Installation dimensions in mm

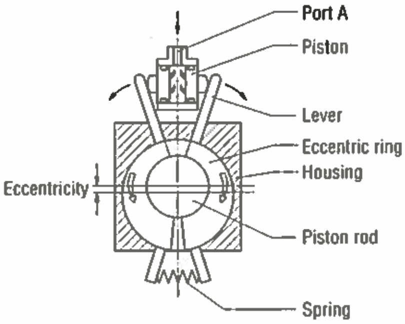


Bore	BA	BC	BD	BE	BF	FF	MR	WF	ZB
50	64	81	23.5	57	30.5	G1/4"	M6	35	256
63	77	91	23.5	69	39	G1/4"	M6	37	282
80	96	113	28	82	45	G1/4"	M8	42	324

Note: All other dimensions as for standard cylinder – see page MZ 1.7

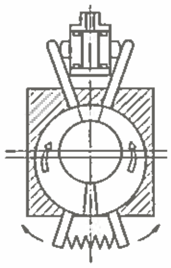
5. Principle of operation

Brake release



When air is applied to port 'A' the two pistons extend and operate the levers which rotate the eccentric rings in the direction indicated by the arrows thereby releasing the piston rod.

Brake applied



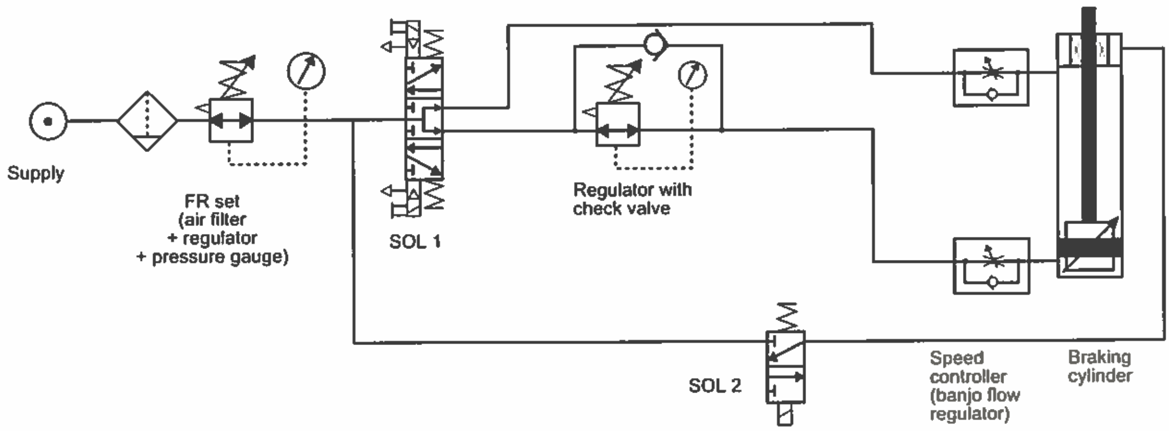
When air is exhausted through port 'A' the eccentric rings are rotated as indicated by the arrows under action of the spring force thereby imparting an eccentric load to the piston rod causing it to brake (stop).

Manual brake release procedure

By screwing a hexagon socket bolt into the female screw in the top of the brake unit the brake can be released.

Note: *The hexagon bolt MUST be removed during normal operation*

6. Basic circuit diagram



SOL 1 (A)	SOL 1 (B)	SOL 2	Operating condition
OFF	OFF	OFF	Stop
ON	OFF	ON	Forward
OFF	ON	ON	Backward

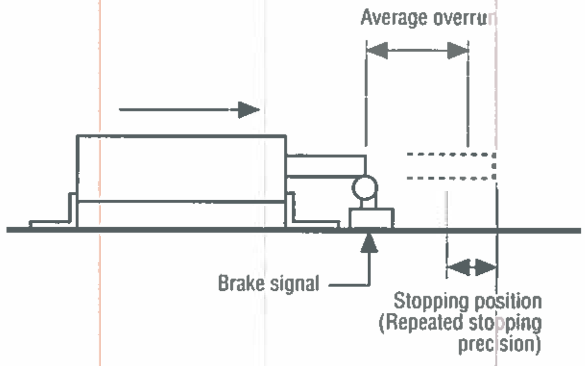
For correct operation the installation should be as shown in the circuit diagram above and the following basic instructions adhered to:-

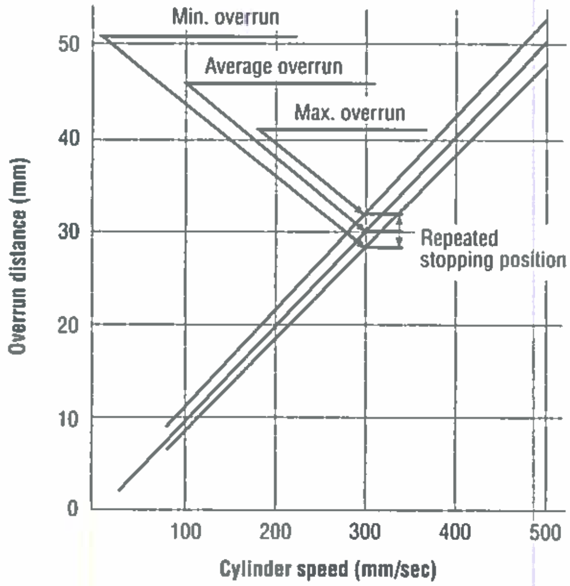
a) When the piston rod is stationary apply pressure to both sides of the piston in order to prevent jumping of piston rod at time of starting. i.e. Use pressure applied neutral valve for SOL 1.

b) Install a regulator with check valve at the larger thrust side to secure a balanced thrust and prevent sticking at time of starting.

c) Install the brake release solenoid valve SOL 2 (3/2 normally closed valve) as close to the brake port as possible.

7. Stopping precision and overrun





The characteristic function shown above is based on the case that at no load the break release port and the solenoid valve piping are 1m long respectively.

Stopping precision

Stopping pitch and load factor

The stopping precision varies according to the stopping pitch and the load factor.

To achieve the specified stopping precision the following load factors are recommended.

Stopping pitch	Load factor
<50mm	20% on thrust
50-100mm	40% on thrust
>100mm	60% on thrust

Selection of solenoid valve for brake operation.

The stopping precision and the overrun distance are dependent on the response ability and effective sectional area of the solenoid valve used for brake operation (SOL 2 in the basic circuit diagram). To obtain optimum stopping precision the solenoid valve should be connected direct to the brake release port. The most suitable valve for this purpose is a VE25C – see relevant valve catalogue.

Brake holding force

Bore	Force (N)
50	1570
63	2450
80	3920

8. Electric control circuit

As stopping accuracy, etc are dependent on the control devices used and circuits, follow the instructions given below:-

1) Select a brake which has quick and accurate response capability.

2) Output break release signal and cylinder control signal simultaneously or give priority to the brake release signal in order to prevent jumping of the piston rod at the time of brake release.

3) Select self holding circuit for a stop signal detecting switch circuit.

4) For stop signal detecting switch, select cylinder switch, roller plunger type limit switch,proximity switch or photo electric cell.

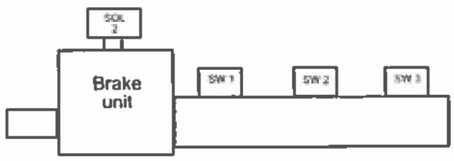
Notes on using sequencer

When the brake is actuated consideration must be given to the following:-

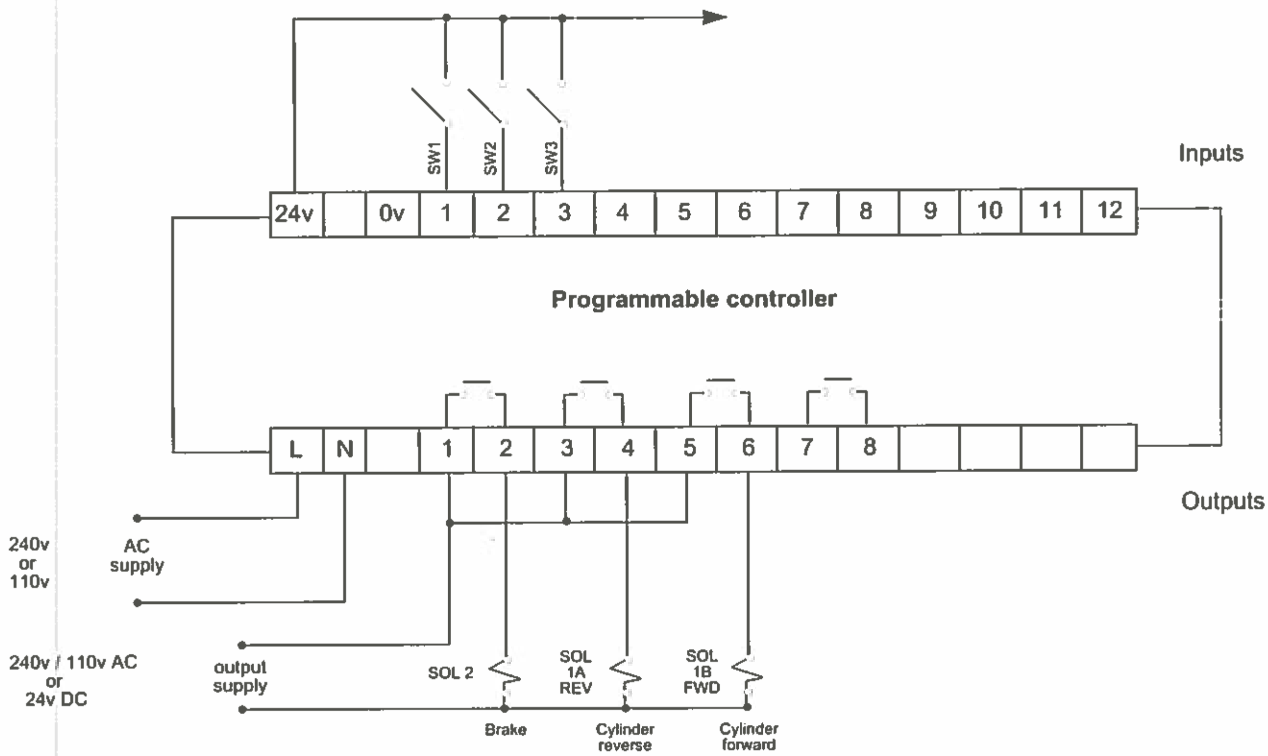
1) PLC scan time
Brake actuation timing can vary according to the scan time dispersement which may result in a discrepancy in the stopping accuracy.

2) Cylinder speed
With a high cylinder speed the response time from initiation of stop signal to actuation of brake may result in an overtravel which must be taken into account when setting up the system.

Typical connection diagram to PLC using Reed switches



SOL2 = Brake release solenoid
SW1 = End of stroke forward switch
SW2 = Positional stop switch
SW3 = End of stroke reverse switch

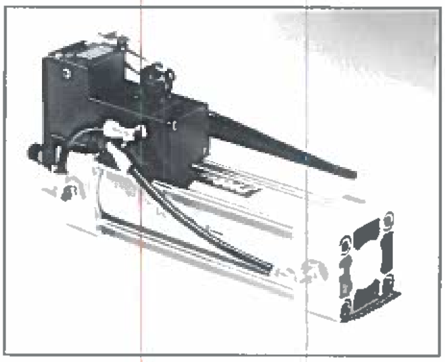


Note: Solid state switches with PNP output may also be used but require alternative connection details.

9. Ordering procedure

Order in accordance with model codes shown to suit installation requirements.

Double acting positioner controlled cylinders - MZ series - compact unit 32, 40, 50, 63, 80, 100mm bore



1. General description

The positioner unit enables the cylinder piston rod to be stroked to any position by varying the signal pressure.

The positioning of the piston rod proportional to the signal pressure can be done with accuracy and repeatability of 1% of full stroke.

2. Model code

Bore	Model
32	MZ*0329LDCE x stroke
32	MZ*0329LDCR x stroke
40	MZ*0409LDCE x stroke
40	MZ*0409LDCR x stroke
50	MZ*0509LDCE x stroke
50	MZ*0509LDCR x stroke
63	MZ*0639LDCE x stroke
63	MZ*0639LDCR x stroke
80	MZ*0809LDCE x stroke
80	MZ*0809LDCR x stroke
100	MZ*1009LDCE x stroke
100	MZ*1009LDCR x stroke

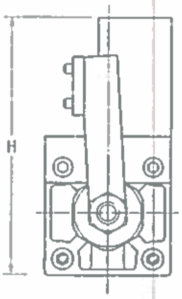
Note: CE = CAM EXTENDS with increase in signal pressure
CR = CAM RETRACTS with increase in signal pressure
** MZE = Magnetic piston*
MZ = Non magnetic piston

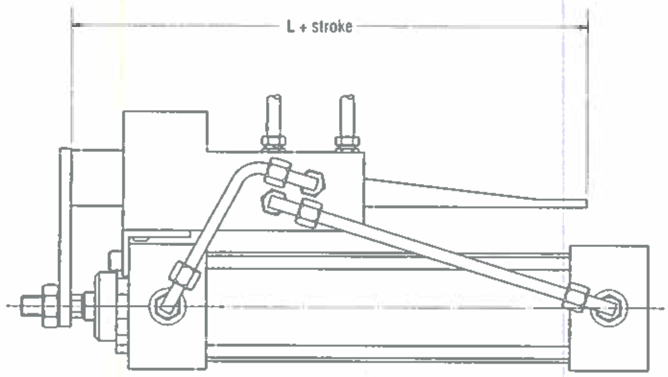
3. Operating data

Operating pressure range	1 to 7.8 bar (14.5 to 113 psig)
Signal pressure range	0.21 to 1.03 bar (3 to 15 psig)
Ambient operating temperature range	–20°C to +75°C (–4°F to +158°F)
Stroke limitation	50mm to 1000mm
Repeatability	1% of full stroke
Cam characteristics	Linear
Mass	Mass for standard cylinder as given on page MZ 1.4 plus 2.25 kg
Mounting	Can be used with all types of mounting except front flange (model MZ***S – MF1K)
Availability	Available for all bore sizes 32mm to 100mm

4. Installation dimensions in mm

Bore	H	L
32	128	124
40	140	124
50	155	124
63	166	124
80	189	124
100	207	124



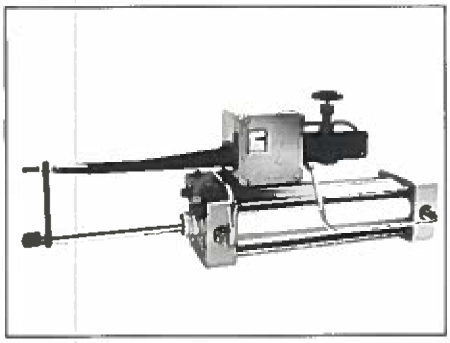


5. Ordering procedure

Available to special order in accordance with model codes shown to suit installation requirements and relevant bore and stroke size.

Double acting positioner controlled cylinders - MZ series - KENT unit

80, 100mm bore



1. General description

The positioner unit enables the cylinder piston rod to be stroked to any position by varying the signal pressure.

The positioning of the piston rod proportional to the signal pressure can be done with accuracy and repeatability of 0.1% of full stroke.

2. Model code

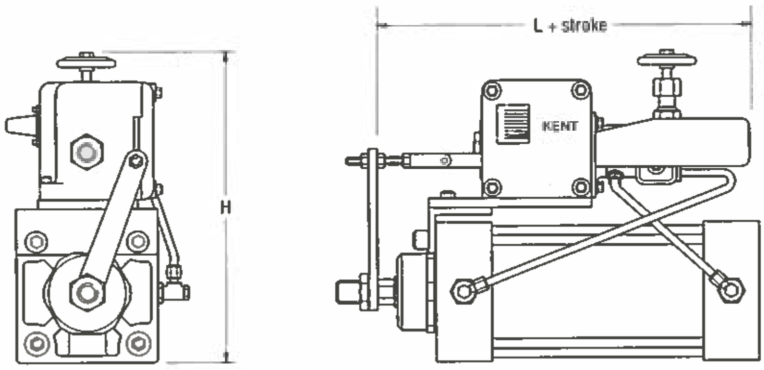
Bore	Model
80	MZ*0809KD x stroke
100	MZ*1009KD x stroke

** Note: MZE = Magnetic piston*
MZ = Non magnetic piston

3. Operating data

Operating pressure range	1 to 10 bar (14.5 to 145 psig)
Signal pressure range	0.21 to 1.03 bar (3 to 15 psig)
Ambient operating temperature range	–20°C to +75°C (–4°F to +158°F)
Stroke limitation	100mm to 600mm to ensure maximum repeatability
Repeatability	0.1% of full stroke
Cam characteristics	Linear
Mass	Mass for standard cylinder as given on page MZ 1.4 plus 6.6kg + 0.25kg per 25mm stroke
Mounting	Can be used with all types of mounting except front flange (model MZ***S – MF1K)
Availability	Available for bore sizes 80mm to 100mm only

4. Installation dimensions in mm



Bore	H	L
80	241	214
100	249	214

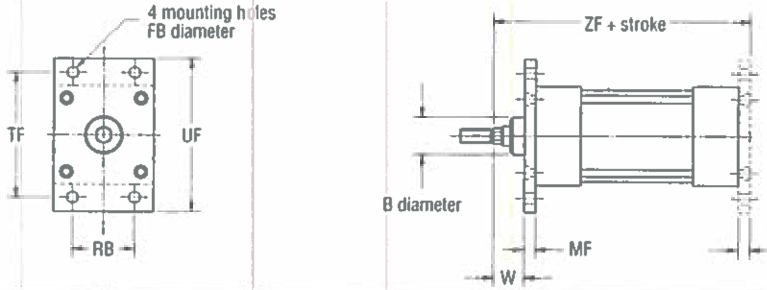
5. Ordering procedure

Available to special order in accordance with model codes shown to suit installation requirements and relevant bore and stroke size.

Mountings

1. Front (MF1) and rear (MF2) flange – to ISO 6431

Installation dimensions in mm, model code and mass



Cylinder bore	B	FB	MF	RB	TF	UF	W	ZF
32	29	7	10	32	64	84	16	130
40	31.5	9	10	36	72	92	20	145
50	48	9	10	45	90	110	25	155
63	48	9	12	50	100	125	25	170
80	50	12	12	63	126	155	30	190
100	50	14	15	75	150	180	35	205

Model code

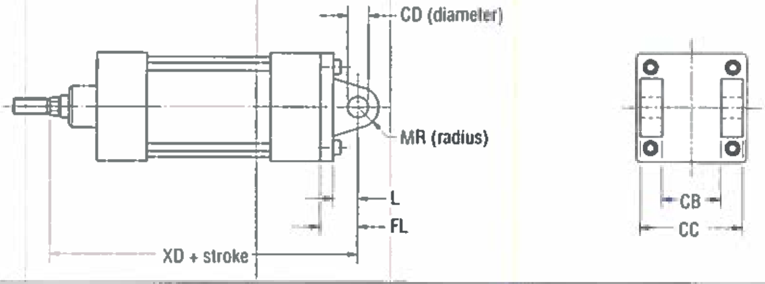
*Note: 1) Kit number M***S – MF1K is suitable for front or rear fitment*

2) Kit supplied complete with fixing screws

Cylinder bore	Kit number	Mass
32	M032S – MF1K	0.25kg
40	M040S – MF1K	0.30kg
50	M050S – MF1K	0.40kg
63	M063S – MF1K	0.75kg
80	M080S – MF1K	1.25kg
100	M100S – MF1K	2.25kg

2. Rear clevis (MP2) – to ISO 6431

Installation dimensions in mm, model code and mass



Cylinder bore	CB	CC	CD	FL	L	MR	XD
32	26	45	10	22	12	11	142
40	28	52	12	25	15	11	160
50	32	60	12	25	15	13	170
63	40	70	16	32	20	16	190
80	50	90	16	32	20	16	210
100	60	110	20	40	25	21	230

Model code

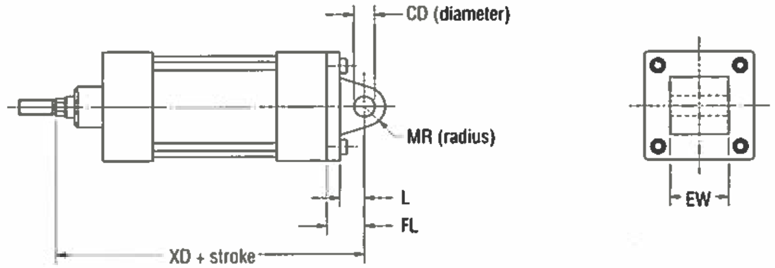
Note: 1) Pivot pin is supplied seperately – see page MZ 4.1

2) Kit supplied complete with fixing screws

Cylinder bore	Kit number	Mass
32	M032S – MP2K	0.20kg
40	M040S – MP2K	0.30kg
50	M050S – MP2K	0.40kg
63	M063S – MP2K	0.80kg
80	M080S – MP2K	1.20kg
100	M100S – MP2K	2.30kg

3. Rear eye (MP4) – to ISO 6431

Installation dimensions in mm, model code and mass



Cylinder bore	CD	EW	FL	L	MR	XD
32	10	26	22	12	11	142
40	12	27.8	25	15	11	160
50	12	31.8	25	15	13	170
63	16	39.8	32	20	16	190
80	16	49.8	32	20	16	210
100	20	59.8	40	25	21	230

Model code

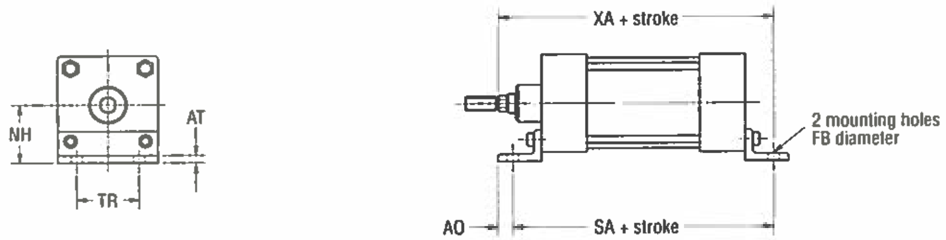
Cylinder bore	Kit number	Mass
32	M032S – MP4K	0.20kg
40	M040S – MP4K	0.30kg
50	M050S – MP4K	0.43kg
63	M063S – MP4K	0.80kg
80	M080S – MP4K	1.20kg
100	M100S – MP4K	2.30kg

Note: 1) *Pivot pin is supplied seperately – see page MZ 4.1*

2) *Kit supplied complete with fixing screws*

4. Feet (MS1) – to ISO 6431

Installation dimensions in mm, model code and mass



Cylinder bore	AO	AT	FB	NH	SA	TR	XA
32	11	4	7	32	142	32	144
40	12	4	9	36	161	36	163
50	10	5	9	45	170	45	175
63	14	5	9	50	185	50	190
80	13	8	12	63	210	63	215
100	25	8	14	71	220	75	230

Model code

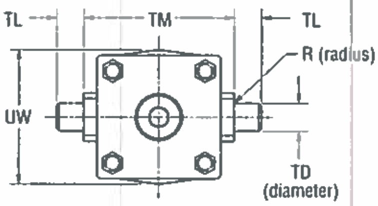
Cylinder bore	Kit number	Mass
32	M032S – MS1K	0.15kg
40	M040S – MS1K	0.25kg
50	M050S – MS1K	0.30kg
63	M063S – MS1K	0.50kg
80	M080S – MS1K	1.00kg
100	M100S – MS1K	1.35kg

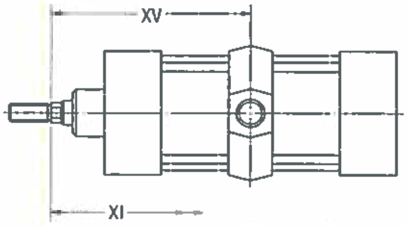
Note: 1) *Kit number M***S – MS1K is supplied as a pair*

2) *Kit supplied complete with fixing screws*

5. Centre trunnion (MT4) – to ISO 6431

Installation dimensions in mm, model code and operating data





XI = reference dimension at zero stroke

Bore	R	TD	TL	TM (ISO)	[TM (CETOP)]	UW	XI	XV (min)	XV(max)
32	1.0	12	12	50	[N/A]	50	73	73	Stroke + 73
40	1.5	16	16	63	[75]	60	82.5	82.5	Stroke + 82.5
50	1.6	16	16	75	[85]	75	90	90	Stroke + 90.0
63	1.6	20	20	90	[105]	90	97.5	101.5	Stroke + 93.5
80	1.6	20	20	110	[125]	114	110	117	Stroke + 103
100	2.0	25	25	132	[155]	138	120	127	Stroke + 113

Notes: 1) ***Standard MT4 cylinder of 'MZ' type will be to ISO dimensions. For replacements for 'M' type cylinder with CETOP trunnion please ensure this is stated when ordering***

2) *When ordering, cylinder and trunnion must be ordered together and dimensions XV **MUST** be specified – All cylinders will be given a unique SC part number for dimensional traceability, if not mounted in central position.*

3) *Trunnion supplied in central position as standard XV = 1/2 stroke + XI.*

4) *XV variations from central position are supplied to special order – minimum and maximum permitted values are given above.*

5) *For twin cylinders of unequal stroke customer must specify which cylinder is to fitted with trunnion mounting.*

6) *When Trunnion is in extreme front or rear position magnetic sensors (if fitted) will not detect end of stroke at trunnion location.*

Model code

Bore	Model
32	MZ*0321NDMT x stroke (XV = ***)
40	MZ*0401DDMT x stroke (XV = ***)
50	MZ*0501DDMT x stroke (XV = ***)
63	MZ*0631DDMT x stroke (XV = ***)
80	MZ*0801DDMT x stroke (XV = ***)
100	MZ*1001DDMT x stroke (XV = ***)

*** Note:** *MZE = Magnetic piston*
MZ = Non magnetic piston

Operating data

All operating data is consistant with that for standard cylinders shown on page MZ 1.4

Mass	Mass for standard cylinder as given on page MZ 1.4 plus
	32mm bore cylinder – 0.25 kg
	40mm bore cylinder – 0.44 kg
	50mm bore cylinder – 0.65 kg
	63mm bore cylinder – 0.86 kg
	80mm bore cylinder – 1.58 kg
	100mm bore cylinder – 2.20 kg

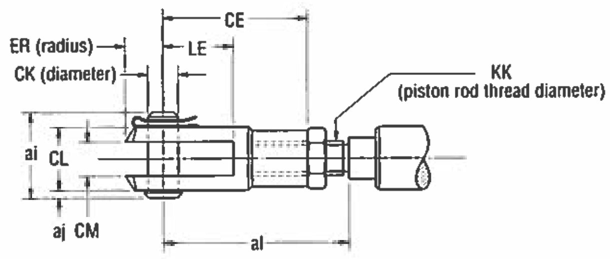
6. Ordering procedure

Order in accordance with model codes shown to suit installation requirements and relevant cylinder bore.

Accessories

1. Fork end with pivot pin – to ISO 8140

Installation dimensions in mm, model code and mass



Bore	ai	aj	al(min)	al(max)	CE	CK	CL	CM	ER	KK	LE
32	28	2.5	47	52	40	10	20	10	16	M10 x 1.25	20
40	32.5	3.0	57	60	48	12	24	12	19	M12 x 1.25	24
50 and 63	42	3.5	74	80	64	16	32	16	25	M16 x 1.50	32
80 and 100	52.5	4.0	92	101	80	20	40	20	32	M20 x 1.50	40

Note: *80/100mm fork end uses a double clip and pin instead of single clip and headed pin as shown*

Model code

Note: *Piston rod locknut provided as standard with fork end*

Cylinder bore	Fork end with pivot pin	Mass
32	C025S – FEK	0.04kg
40	M040S – FEK	0.15kg
50 and 63	M063S – FEK	0.35kg
80 and 100	M080S – FEK	0.75kg

2. Rod spherical bearing (heavy duty) – to ISO 8139

Installation dimensions in mm, model code and mass

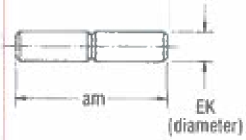
Bore	A	CE	CN	EN	ER	KK	Z°
32	20	43	10	14	28	M10 x 1.25	4.5°
40	22	50	12	16	32	M12 x 1.25	13°
50 and 63	28	64	16	21	42	M16 x 1.50	15°
80 and 100	33	77	20	25	50	M20 x 1.50	15°

Model code

Cylinder bore	Rod spherical bearing	Mass
32	C025S – SREK	0.04kg
40	M040S – SREK	0.11kg
50 and 63	M063S – SREK	0.21kg
80 and 100	M080S – SREK	0.38kg

3. Pivot pin

Installation dimensions in mm, model code and mass



Bore	am	EK
32	45	9.94
40	52	11.94
50	60	11.94
63	70	15.94
80	90	15.94
100	110	19.93

Model code

Cylinder bore	Pivot pin	Mass
32	M032S – PP	0.03 kg
40	M040S – PP	0.04 kg
50	M050S – PP	0.05 kg
63	M063S – PP	0.11 kg
80	M080S – PP	0.15 kg
100	M100S – PP	0.25 kg

4. Piston rod locknut

Installation dimensions in mm, model code and mass

Model code

Cylinder bore	Thread size	Piston rod locknut	Mass
32	M10 x 1.25	M0251 – 9	0.01 kg
40	M12 x 1.25	M0401 – 9	0.01 kg
50 and 63	M16 x 1.50	M0631 – 9	0.02 kg
80 and 100	M20 x 1.50	M0801 – 9	0.03 kg

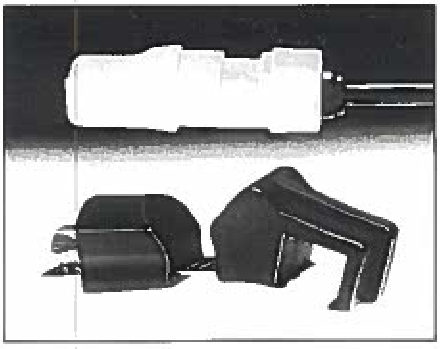
5.Ordering procedure

Order in accordance with model codes shown to suit installation requirements and relevant cylinder bore.

ISO 6431 Power cylinders

Magnetic sensors - Solid state (PNP) switch

32, 40, 50, 63, 80, 100mm bore



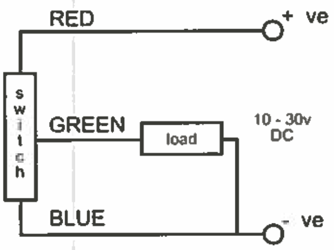
1. General description and application benefits

Continuously rated PNP operation solid state switch with LED indicator and 2 metre flying lead for use on all sizes of 'MZE' or 'MZS' ranges of cylinders.

Switch is fitted to cylinder tie rods by means of a universal clamp assembly.

- Compact
- Integral LED indicator (Red)
- Ease of fitting

PNP switch operation



2. Functional symbols

3. Model code

Preferred model selection

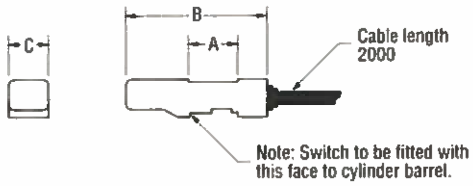
885382	PNP switch with 2 metre flying lead
885399	Universal tie rod clamp

4. Operating data

Contact function	Normally open	
Protection	IP 67	
Voltage	10 – 30v DC	
Voltage drop (maximum)	1.0v	
Current (maximum)	400mA	
Switching capacity	12w	
Switch ON time	1.5 microseconds	
Switch OFF time	0.5 microseconds	
Repeatability	0.1mm	
Working temperature	– 10°C to +70°C (+15°F to +158°F)	
Body housing	Nylon 66	
Cable length	2 metres	
Cable specification	3 core (7 x 0.2mm^2)	
LED indication	Red	
Method of switch fixing	Universal tie rod clamp with worm drive	
Mass – switch	885382	0.040kg
– tie rod clamp	885399	0.007kg

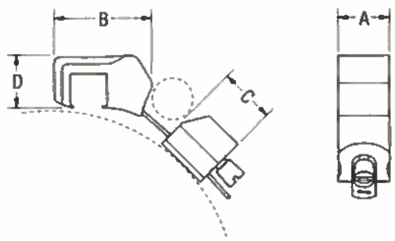
5. Installation dimensions in mm

Switch 885382



A	B	C
13	36	10

Tie rod clamp 885399



A	B	C	D
12.5	25	20	16

6. Ordering procedure

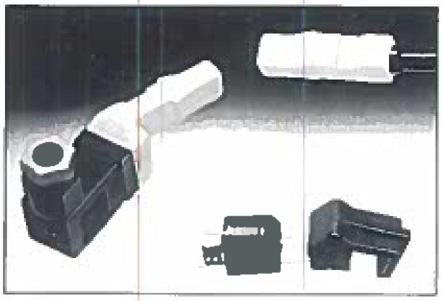
Order in accordance with preferred model selection shown above.

VICKERS **Pneumatics**

ISO 6431 Power cylinders

Magnetic sensors - Reed switch

32, 40, 50, 63, 80, 100mm



1. General description and application benefits

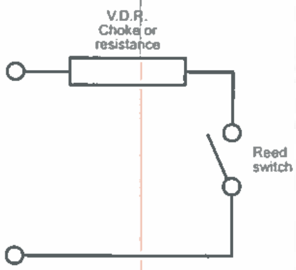
Continuously rated reed switches with LED indicator and either 2 metre flying lead or miniature DIN plug.

For use on all sizes of 'MZE' or 'MZS' ranges of cylinders.

Switch is fitted to cylinder tie rods by means of a universal clamp assembly.

- Compact
- Integral LED indicator (Red)
- Ease of fitting

Reed switch operation



Warning:

For cable runs over 5m protect switch from inrush either by using a 680mh choke or a resistor fitted in series.

For inductive loads a voltage dependent resistor with a higher clamping voltage than the supply must be used.

Protection must be fitted within 2m of the switch.

2. Functional symbols

3. Model code

Preferred model selection

885385	Reed switch with 2 metre flying lead
885386	Reed switch with miniature DIN plug
885399	Universal tie rod clamp

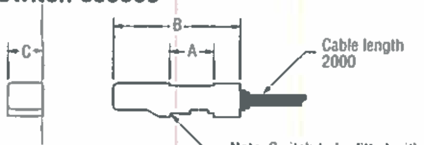
4. Operating data

Contact function	Normally open	
Protection	IP 67	
Voltage (maximum)	240v AC / 200v DC	
Voltage drop (maximum)	3.0v	
Current (maximum)	380mA	
Switching capacity	50w	
Switch ON time	1.5 milliseconds	
Switch OFF time	1.5 milliseconds	
Repeatability	0.1mm	
Working temperature	– 10°C to +70°C (+15°F to 158°F)	
Body housing	Nylon 66	
Cable length*	2 metres	
Cable specification*	2 core (16 x 0.2mm²)	
LED indication	Red	
Method of switch fixing	Universal tie rod clamp with worm drive	
Mass – switch	885385	0.085kg
– switch	885386	0.018kg
– tie rod clamp	885399	0.007kg

*Note: * – refers to switch with flying lead (ref 885385)*

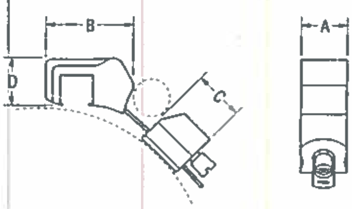
5. Installation dimensions in mm

Switch 885385



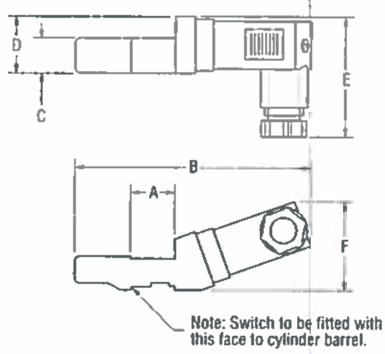
A	B	C
13	38	10

Tie rod clamp 885399



A	B	C	D
12.5	25	20	16

Switch 885386



A	B	C	D	E	F
13	67	10	16	33	27

6. Ordering procedure

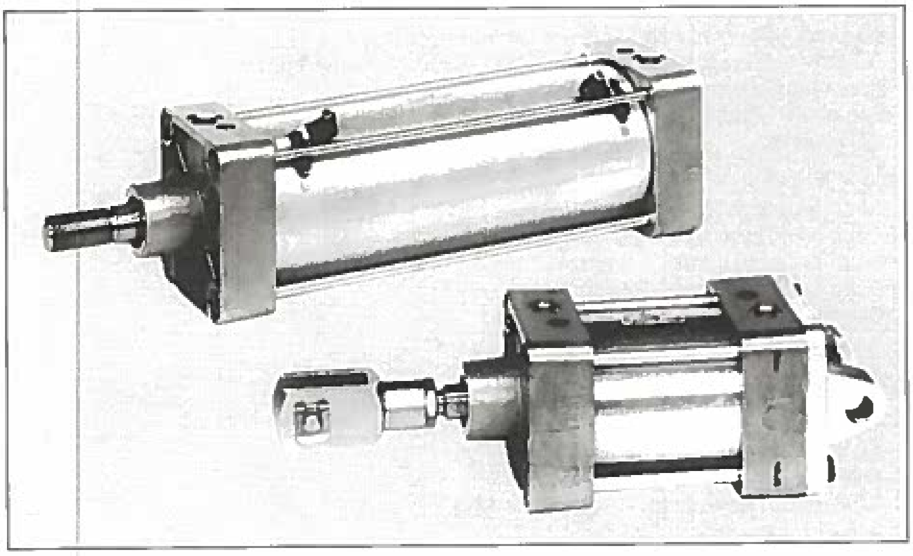
Order in accordance with preferred model selection shown above to suit installation requirements.

Vickers Systems Division, TRINOVA Limited., Lang Pneumatic Products, Halesfield 6, Telford, Shropshire TF7 4LF.
Tel: (01952) 586000 Fax: (01952) 586798

VICKERS **Pneumatics**

ISO 6431 Power cylinders

Double acting - MZ / MD series - MIDAS II
125, 160, 200, 250, 320mm bore



1. General description and application benefits

A range of double acting, single rod and through rod fully adjustable cushioned metric cylinders to ISO 6431, CETOP RP53P and BS4862 Part 2: 1983 standards.

- Simple reliable design.
- Conforms to ISO 6431 and CETOP standards.
- Long seal life.
- Magnetic piston option.
- Adjustable air cushioning.
- Full range of mounting accessories.

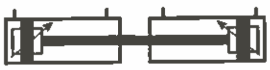
2. Functional symbols

Basic cylinder

Through rod cylinder

Rear connection cylinder

Front connection cylinder



3. Preferred model selection

Magnetic piston

Bore	Model code	Stroke
125mm	MZE1251DD x Stroke	Strokes to order
160mm	MZE1601DD x Stroke	Strokes to order
200mm	MDE2001DD x Stroke	Strokes to order
250mm	MDE2501DD x Stroke	Strokes to order

Ordering example:-
MZE1251DDx200 = 125mm bore double acting cylinder x 200mm stroke with magnetic piston.

Non magnetic piston

Bore	Model code	Stroke
125mm	MZ1251DD x Stroke	Strokes to order
160mm	MZ1601DD x Stroke	Strokes to order
200mm	MD2001DD x Stroke	Strokes to order
250mm	MD2501DD x Stroke	Strokes to order
320mm	MD3201DD x Stroke	Strokes to order

Ordering example:-
MD2501DDx160 = 250mm bore double acting cylinder x 160mm stroke.

Other models available

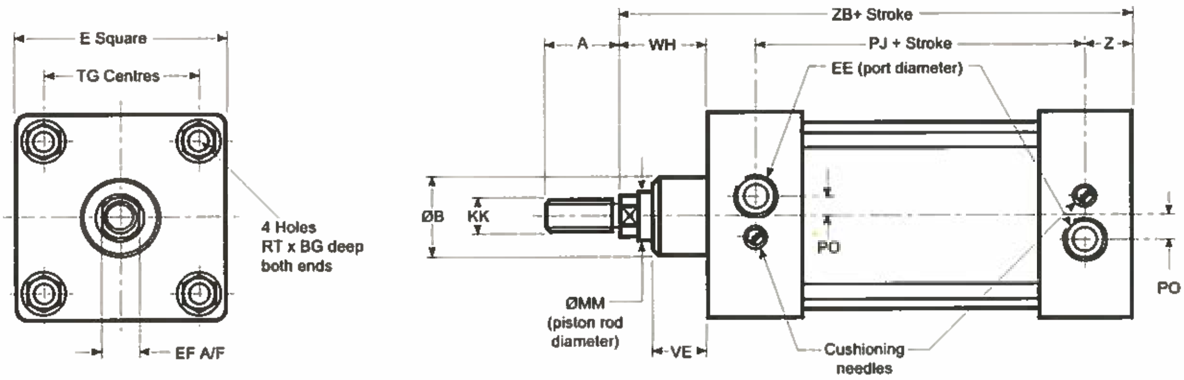
- Gaitered.
- High temperature.
- Details of other special models on request.

4. Operating data

Standards	ISO 6431 CETOP RP53P BS4862 Part2: 1983
Operating pressure	1.0 - 10 bar (14.5 - 145 psig)
Ambient operating temperature range	-20° C to + 75° C (-4°F to + 158° F)
Materials of construction	Barrel - Anodised aluminium alloy (125 - 250mm bore) Steel (320mm bore) Piston rod - Stainless steel (125 - 160mm bore) Chrome plated carbon steel (200 - 320mm bore) Piston -Aluminium End covers - Aluminium alloy Seals - Nitrile
Cushioning	Fully adjustable air cushioning at both ends
Cushioning length	125mm bore cylinders - 30mm 160mm bore cylinders - 34mm 200mm bore cylinders - 19mm 250mm bore cylinders - 24mm 320mm bore cylinders - 26mm
Type of connection	Screwthread
Port size	1/2" BSP - 1" BSP
Operating medium	Compressed air, filtered and lubricated (use ISO VG 37 mineral oil).
Installation dimensions	Basic cylinders - See page M 1.3 Cylinder options - See pages M 2.1-2 Cylinders with mountings - See pages M 3.1-2 Cylinder accessories - See page M 3.2 Magnetic sensors - See page M 4.1
Mass (Basic cylinder)	MZE1251DDx*** 8.4kg + 0.330kg per 25mm stroke MZE1601DDx*** 12.5kg + 0.530kg per 25mm stroke MDE2001DDx*** 24.8kg + 0.950kg per 25mm stroke MDE2501DDx*** 36.7kg + 1.100kg per 25mm stroke MZ1251DDx*** 8.4kg + 0.330kg per 25mm stroke MZ1601DDx*** 12.5kg + 0.530kg per 25mm stroke MD2001DDx*** 24.8kg + 0.850kg per 25mm stroke MD2501DDx*** 36.7kg + 1.095kg per 25mm stroke MD3201DDx*** 57.2kg + 2.132kg per 25mm stroke
Mass (Options)	Through rod cylinders - as above + additions as shown on page M 2.1 Rear connection cylinders - as above + additions as shown on page M 2.1 Front connection cylinders - as above + additions as shown on page M 2.2 Gaitered cylinders - as above + additions as shown on page M 2.2
Mountings	See pages M 3.1-2
Accessories	See page M 3.2
Magnetic sensors	See page M 4.1
Service kits	MZE1251DDx*** Series KC 97 Mass 0.22kg MZE1601DDx*** Series KC 98 Mass 0.29kg MDE2001DDx*** Series KC172 Mass 0.31kg MDE2501DDx*** Series KC150 Mass 0.35kg MZ1251DDx*** Series KC 48 Mass 0.20kg MZ1601DDx*** Series KC 49 Mass 0.26kg MD2001DDx*** Series KC111 Mass 0.28kg MD2501DDx*** Series KC 99 Mass 0.33kg MD3201DDx*** Series KC102 Mass 0.45kg

5. Installation dimensions in mm

125 - 160mm bore



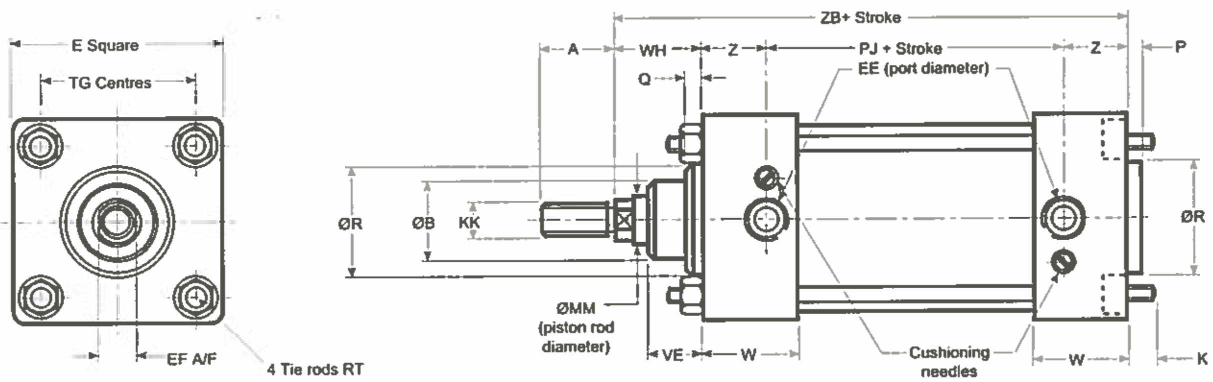
Bore	A	B	BG	E	EE	EF	KK	MM	PJ	PO
125	54[1]	70	18	146	G1/2"	27	M27 x 2.00[1]	32	118	18
160	72	80	18	185	G3/4"	36	M36 x 2.00	44	130	19

Bore	RT	TG	VE	WH	Z	ZB
125	M12 x 1.75	108	47	63	23	227
160	M12 x 1.75	141	61	81	24	259

[1] Dimensions conform to ISO standard only - if required to CETOP standard (i.e. A = 48 and KK = M24 x 2.00), for replacement of existing cylinder, please specify on order and quote M125*DD**x***.

Note: *Piston rod locknuts are not supplied as standard - please order separately (see page M 3.2)*

200 - 320mm bore



Bore	A	B	E	EE	EF	K	KK	MM	P	PJ
200	72	90	220	G3/4"	46	42	M36 x 2.00	50	5	124
250	84	90	280	G1"	46	50	M42 x 2.00	55	7	132
320	96	90	345	G1"	50	60	M48 x 2.00	55	7	142

Bore	Q	R	RT	TG	VE	W	WH	Z	ZB
200	16	120	M16 x 2.00	168	57	54	90	33	280
250	16	120	M20 x 2.50	213	57	63	100	39	310
320	16	120	M24 x 3.00	260	63	73	115	44	345

Note: *Piston rod locknuts are not supplied as standard - please order separately (see page M 3.2)*

Cylinder options

Double acting through rod cylinders - MZ series
125, 160mm bore

1. Model code

Bore	Model
125	MZ*1254DD x stroke
160	MZ*1604DD x stroke

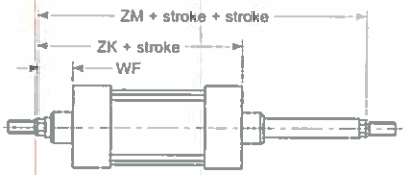
** Note: MZE = Magnetic piston, MZ= Non magnetic piston*

2. Operating data

All operating data is consistent with that for standard cylinders shown on page M 1.2

Mass	Mass for standard cylinder as given on page M 1.2 plus		
	MZ*1254DD x ***	1.77kg + 0.15kg per 25mm stroke	
	MZ*1604DD x ***	3.38kg + 0.32kg per 25mm stroke	
Service kits	MZ*1254DD x ***	KC92	Mass 0.25kg
	MZ*1604DD x ***	KC93	Mass 0.31kg

3. Installation dimensions in mm



Bore	WF	ZK	ZM
125	63	227	290
160	81	259	340

Double acting rear connection cylinders - MZ series
125, 160mm bore

1. Model code

Bore	Model
125	MZ*1255DD x stroke
160	MZ*1605DD x stroke

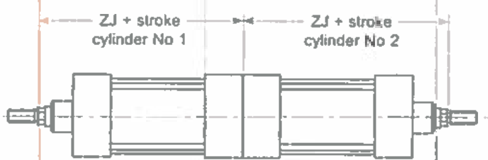
** Note: MZE = Magnetic piston, MZ = Non magnetic piston*

2. Operating data

All operating data is consistent with that for standard cylinders shown on page M 1.2

Mass	Sum of mass for each standard cylinder as given on page M 1.2

3. Installation dimensions in mm



Note: Rear connection cylinders will give 3 or 4 positive positions

Bore	ZJ
125	227
160	259

Cylinder options (cont)

Double acting front connection cylinders - MZ series
125, 160mm bore

1. Model code

Bore	Model
125	MZ*1256DD x stroke
160	MZ*1606DD x stroke

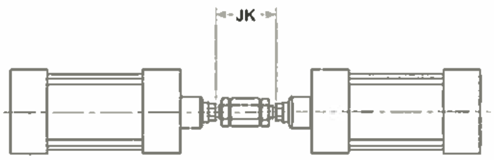
** Note: MZE = Magnetic piston, MZ = Non magnetic piston*

2. Operating data

All operating data is consistent with that for standard cylinders shown on page M 1.2

Mass	Mass for standard cylinder as given on page M 1.2 plus	
	MZ*1256DD x ***	0.70kg + 0.66kg per 25mm stroke
	MZ*1606DD x ***	1.80kg + 1.06kg per 25mm stroke

3. Installation dimensions in mm



Bore	JK
125	97
160	145

Note: Front connection cylinders will give 3 or 4 positive positions

Double acting gaitered cylinders - MZ / MD series
125, 160, 200, 250, 320mm bore

1. Model code

Bore	Model
125	MZ*1251DDG[1] x stroke
160	MZ*1601DDG[1] x stroke
200	MD*2001DDG[1] x stroke
250	MD*2501DDG[1] x stroke
320	MD3201DDG[1] x stroke

*Note: * MZE or MDE = Magnetic piston*
MZ or MD = Non magnetic piston

2. Operating data

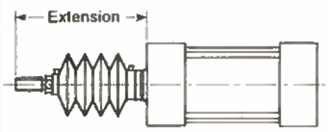
All operating data is consistent with that for standard cylinders shown on page M 1.2

Mass	Mass for standard cylinder as given on page M 1.2 plus	
	MZ*1251DDG[1] x ***	0.50kg + 0.73kg per 100mm stroke
	MZ*1601DDG[1] x ***	0.65kg + 1.27kg per 100mm stroke
	MD*2001DDG[1] x ***	0.80kg + 2.00kg per 100mm stroke
	MD*2501DDG[1] x ***	1.00kg + 3.10kg per 100mm stroke
	MD3201DDG[1] x ***	1.30kg + 5.10kg per 100mm stroke

[1] = Stroke range letter:- A = 0 - 100mm, B = 101 - 200mm, C = 201 - 300mm, D = 301 - 400mm, E = 401 - 500mm, F = 501 - 600mm, G = 601 - 700mm, H = 701 - 800mm, J = 801 - 900mm, K = 901 - 1000mm.

3. Installation dimensions in mm

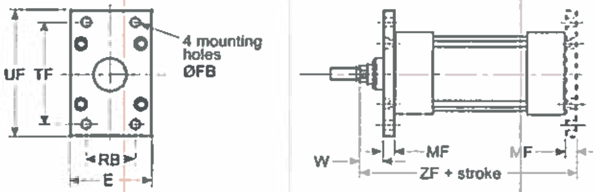
Piston rod extension over standard for stroke ranges shown



Bore	Stroke range reference letter									
	A	B	C	D	E	F	G	H	J	K
125	24	32	40	48	56	64	72	80	88	96
160	24	32	40	48	56	64	72	80	88	96
200	118	130	142	154	166	178	190	202	214	226
250	128	140	152	164	176	188	200	212	224	236
320	143	155	167	179	191	203	215	227	239	251

Mountings

Front (MF1) and rear (MF2) flange - to ISO 6431

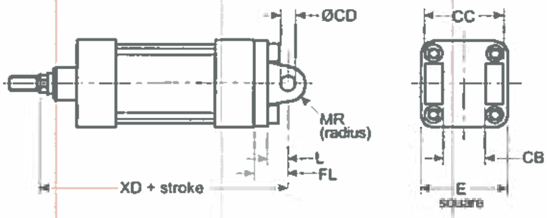


Model code, installation dimensions in mm and mass

Bore	Kit number	E	FB	MF	RB	TF	UF	W	ZF	Mass
125	M125S - MF1K	146	16	18	90	180	221	45	245	3.8kg
160	M160S - MF1K	185	18	21	115	230	276	60	280	7.2kg
200	MD200S - MF1K	220	22	20	135	270	320	70	300	8.6kg
250	MD250S - MF1K	280	26	20	165	330	380	80	330	9.6kg
320	MD320S - MF1K	345	33	25	200	400	460	90	370	18.2kg

*Note: 1) Kit number M****S - MF1KI is suitable for front or rear fitment*
2) Kit supplied complete with fixing screws

Rear clevis (MP2) - to ISO 6431

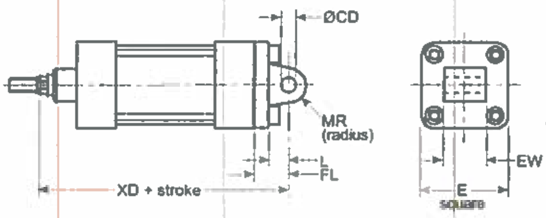


Model code, installation dimensions in mm and mass

Bore	Kit number	CB	CC	CD	E	FL	L	MR	XD	Mass
125	M125S - MP2K	70	130	25	146	48	30	25	275	3.6kg
160	M160S - MP2K	90	170	30	185	56	36.5	31	315	6.8kg
200	MD200S - MP2K	90	170	30	220	55	35	35	335	9.2kg
250	MD250S - MP2K	110	200	40	280	65	45	36	375	9.5kg
320	MD320S - MP2K	120	220	45	345	75	50	40	420	21.0kg

Note: 1) Pivot pin is supplied separately - see page M 3.2
2) Kit supplied complete with fixing screws

Rear eye (MP4) - to ISO 6431

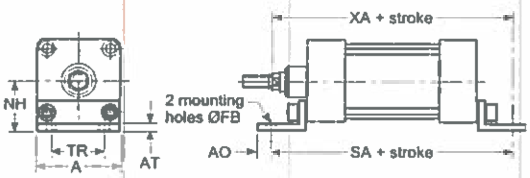


Model code, installation dimensions in mm and mass

Bore	Kit number	CD	E	EW	FL	L	MR	XD	Mass
125	M125S - MP4K	25	146	69.8	48	30	25	275	3.6kg
160	M160S - MP4K	30	185	89.8	56	36.5	31	315	6.8kg
200	MD200S - MP4K	30	220	89.5	55	35	35	335	8.1kg
250	MD250S - MP4K	40	280	109.5	65	45	36	375	17.5kg
320	MD320S - MP4K	45	345	119.5	75	50	40	420	29.0kg

Note: 1) Pivot pin is supplied separately - see page M 3.2
2) Kit supplied complete with fixing screws

Feet (MS1) - to ISO 6431



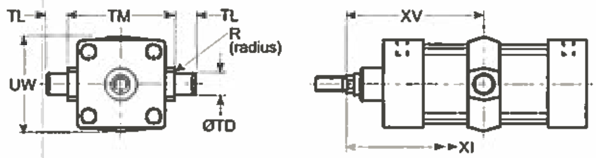
Model code, installation dimensions in mm and mass

Bore	Kit number	A	AO	AT	FB	NH	SA	TR	XA	Mass
125	M125S - MS1K	146	22	8	16	90	250	90	270	2.0kg
160	M160S - MS1K	185	19	10	18	115	300	115	320	3.9kg
200	MD200S - MS1K	220	35	12	22	135	320	135	345	7.3kg
250	MD250S - MS1K	280	30	12	26	165	350	165	380	10.7kg
320	MD320S - MS1K	345	40	12	33	200	390	200	425	15.5kg

*Note: 1) Kit M****S - MS1K is supplied as a pair*
2) Kit supplied complete with fixing screws

Mountings (cont)

Centre trunnion (MT4) - to ISO 6431



XI = reference dimension at zero stroke

***Note:** Trunnion pins are positioned at 90° to cylinder ports.*

Installation dimensions in mm

Bore	R	TD	TL	TM (ISO)	[TM] (CETOP)	UW	XI	XV (min)	XV (max)
125	2	25	25	160	[180]	164	145	152	Stroke+138
160	2.5	32	32	200	[230]	210	170	176	Stroke+164
200	2.5	32	32	250		254	185	179	Stroke+191
250	3.2	40	40	320		310	205	198	Stroke+212
320	3.2	50	50	400		390	230	226	Stroke+234

Standard MT cylinder of 'MZ*' type (125-160mm bore) and 'MD*' type (200-320mm bore) will be to ISO dimensions.
For replacements for 'M' type cylinders (125-160mm bore) with CETOP trunnion please ensure this is stated when ordering and order as M*1251DDMT4 x Stroke or M*1601DDMT4 x Stroke.

Model code and mass (standard cylinder as given on page M 1.2 plus addition shown)

Bore	Model	Additional mass
125	MZ*1251DDMT x stroke (XV + ***)	3.40kg
160	MZ*1601DDMT x stroke (XV + ***)	9.50kg
200	MD*2001DDMT x stroke (XV + ***)	16.00kg
250	MD*2501DDMT x stroke (XV + ***)	18.00kg
320	MD3201DDMT x stroke (XV + ***)	26.00kg

***Note:** * MZE or MDE = Magnetic piston, MZ or MD = Non magnetic piston*

Notes:

1) When ordering, cylinder and trunnion must be ordered together and dimension XV MUST be specified - All cylinders will be given a unique SC part number for dimensional traceability, if not mounted in central position.

2) Trunnion supplied in central position as standard XV = 1/2 stroke + XI.

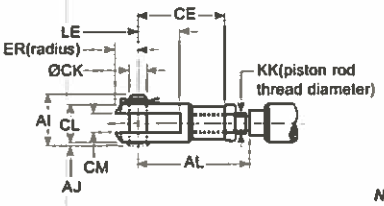
3) XV variations from the central position are supplied to special order - minimum and maximum permitted values are given in dimension table on left.

4) For twin cylinders of unequal stroke customer must specify which cylinder is to be fitted with trunnion mounting.

5) When trunnion is in extreme front or rear position magnetic sensors (if fitted) will not detect end of stroke at trunnion location.

Accessories

Fork end with pivot pin



Piston rod locknut provided as standard with fork end.

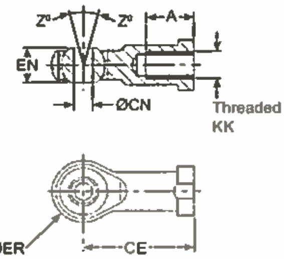
Model code

Bore	
125 (ISO)	MZ125S - FEK¶
125 (CETOP)	M125S - FEK¶
160&200	M160S - FEK
250	MD250S - FEK
320	MD320S - FEK

***Note:** ¶ Specify on order if required to ISO or CETOP standard.*

Bore	AI	AJ	AL (min)	AL (max)	CE	CK	CL	CM	ER (max)	KK	LE	Mass
125(ISO)	65	5	124	134	110	30	55	30	41	M27x2.0	54	1.8kg
125(CETOP)	62	5	114	124	100	25	50	25	41	M24x2.0	50	1.6kg
160&200	87	8.5	174	184	144	35	70	35	57	M36x2.0	72	4.6kg
250	97	6	184	210	168	42	85	42	64	M42x2.0	84	8.5kg
320	108	6	210	240	192	48	96	48	73	M48x2.0	96	12.3kg

Rod spherical bearing



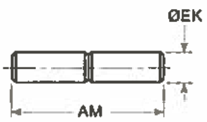
Model code

Bore	
125 (ISO)	MZ125S - SREK¶
125 (CETOP)	M125S - SREK¶
160&200	M160S - SREK
250	MD250S - SREK
320	MD320S - SREK

***Note:** ¶ Specify on order if required to ISO or CETOP standard.*

Bore	A	CE	CN	EN	ER	KK	Z°	Mass
125(ISO)	51	110	30	37	70	M27x2.0	4°	1.15kg
125(CETOP)	42	94	25	31	60	M24x2.0	13°	0.65kg
160&200	56	125	35	43	80	M36x2.0	4°	1.60kg
250	60	142	40	49	90	M42x2.0	15°	2.40kg
320	65	160	50	60	116	M48x2.0	15°	5.00kg

Pivot pin



Model code

Bore	
125	M125S - PP
160	M160S - PP
200	MD200S - PP
250	MD250S - PP
320	MD320S - PP

Bore	AM	EK	Mass
125	130	25	0.50kg
160	170	30	0.95kg
200	180	30	1.00kg
250	210	40	2.60kg
320	230	45	2.90kg

Piston rod locknut

Model code

Bore	
125(ISO)	MZ1251 - 9¶
125(CETOP)	M1251 - 9¶
160&200	M1601 - 9
250	MD2501 - 9
320	MD3201 - 9

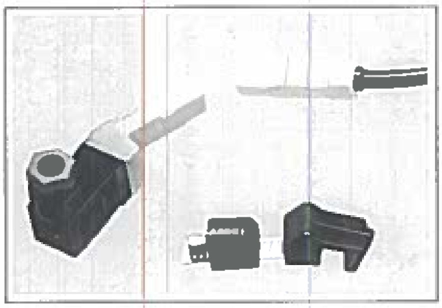
***Note:** ¶ Specify on order if required to ISO or CETOP standard.*

Bore	Thread size	Mass
125(ISO)	M27 x 2.0	0.06kg
125(CETOP)	M24 x 2.0	0.06kg
160&200	M36 x 2.0	0.18kg
250	M42 x 2.0	0.23kg
320	M48 x 2.0	0.29kg

ISO 6431 Power cylinders

Magnetic sensors - Solid state(PNP) switch and Reed switch

125, 160, 200, 250mm



1. General description and application benefits

Continuously rated PNP operation solid state and reed switches with LED indicator and 2 metre flying lead (or miniature DIN plug on reed switch).

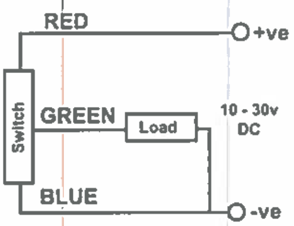
For use on all sizes of 'MZE' or 'MDE' ranges of cylinders.

Switch is fitted to cylinder tie rods by means of a universal clamp assembly.

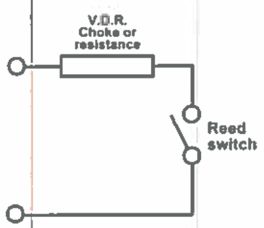
- Compact.
- Integral LED indicator (Red)
- Ease of fitting.

2. Circuit diagrams of switches

Proximity switch



Reed switch



Warning:
For cable runs over 5m protect switch from inrush either by using a 680mh choke or a resistor fitted in series.
For inductive loads a voltage dependent resistor with a higher clamping voltage than the supply must be used.
Protection must be fitted within 2m of the switch.

3. Preferred model selection

Model code	Description
885382	PNP switch with 2 metre flying lead
885385	Reed switch with 2 metre flying lead
885386	Reed switch with miniature DIN plug
885399	Universal tie rod clamp

4. Operating data

Contact function	Normally open	
Protection	IP67	
Maximum voltage/current	PNP switch - 10-30vDC /400mA Reed switch - 200vDC/ 380mA 240vAC/ 380mA	
Voltage drop(maximum)	PNP switch - 1.0v Reed switch - 3.0v	
Switching capacity	PNP switch - 12w Reed switch - 50w	
Switch ON time	PNP switch - 1.5 microseconds Reed switch - 1.5 milliseconds	
Switch OFF time	PNP switch - 0.5 microseconds Reed switch - 1.5 milliseconds	
Repeatability	0.1mm	
Ambient operating temperature range	-10^{0}C to + 70^{0}C (15 F to + 158^0 F)	
Body housing	Nylon 66	
Cable length*	2 metres	
Cable specification*	PNP switch - 3 core (7 x 0.2mm^2) Reed switch - 2 core (16 x 0.2mm^2)	
LED indication	Red (ON)	
Method of switch fixing	Universal tie rod clamp with worm drive	
Mass	Switch 885382 Switch 885385 Switch 885386 Tie rod clamp 885399	0.040kg 0.085kg 0.018kg 0.007kg

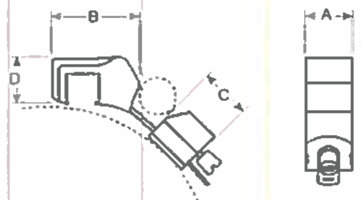
*Note: * - refers to switches with flying lead (885382 and 885385)*

5. Installation dimensions in mm

Switch 885382 / 885385

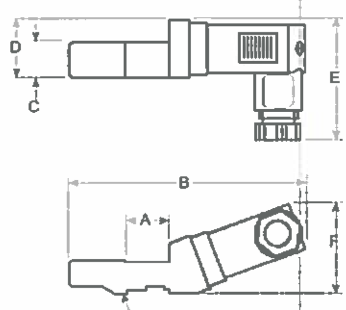
A	B	C
13	38	10

Tie rod clamp 885399



A	B	C	D
12.5	25	20	16

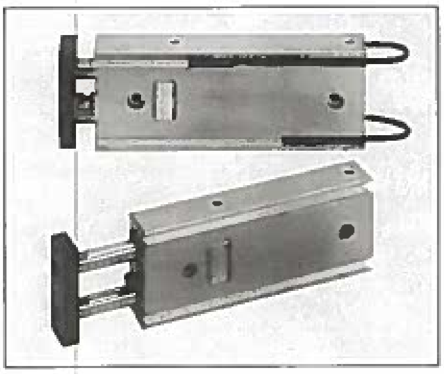
Switch 885386



A	B	C	D	E	F
13	67	10	16	33	27

CKD Twin rod cylinder

Double acting - STR series
6, 10, 16, 20, 25mm bore



1. General description and application benefits

Compact, lightweight double acting twin rod cylinders available in slide bearing or roller bearing versions.
Twin rods arranged and joined in parallel ensures non rotaing action.

- Lightweight.
- High speed.
- High power - Twice thrust of conventional cylinder.
- Stroke limiter.
- Magnetic piston standard.
- Small switches fit within main body.
- Ports in either side of body.
- Suitable for simple robotic applications.

2. Functional symbol

3. Model code

STR - * - * * - * * *
[1] [2] [3]

[1] **Type**
M = Slide bearing
B = Roller bearing

[2] **Bore**
6 = 6mm
10 = 10mm
16 = 16mm
20 = 20mm
25 = 25mm

[3] **Stroke**
See preferred tables below

Preferred model selection

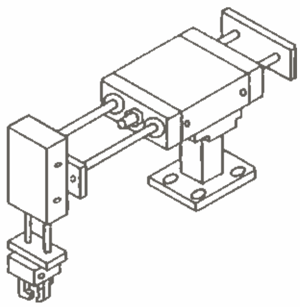
Slide bearing type

Bore	Model code	Stroke 10	20	30	40	50	60	70	80	90	100
6mm	STR - M - 6 - Stroke	■	■	■	■	■					
10mm	STR - M - 10 - Stroke	■	■	■	■	■					
16mm	STR - M - 16 - Stroke	■	■	■	■	■	■	■	■	■	■
20mm	STR - M - 20 - Stroke	■	■	■	■	■	■	■	■	■	■
25mm	STR - M - 25 - Stroke	■	■	■	■	■	■	■	■	■	■

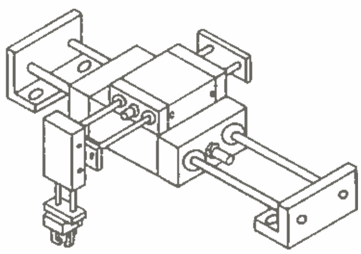
Roller bearing type

Bore	Model code	Stroke 10	20	30	40	50	60	70	80	90	100
6mm	STR - B - 6 - Stroke	■	■	■	■	■					
10mm	STR - B - 10 - Stroke	■	■	■	■	■					
16mm	STR - B - 16 - Stroke	■	■	■	■	■	■	■	■	■	■
20mm	STR - B - 20 - Stroke	■	■	■	■	■	■	■	■	■	■
25mm	STR - B - 25 - Stroke	■	■	■	■	■	■	■	■	■	■

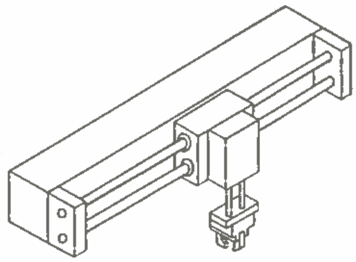
4. Typical applications for twin rod cylinders (mounted on slide units)



2 axis pick and place



3 axis X-Y table



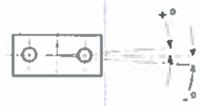
3 axis long stroke pick and place

5. Operating data

Operating pressure	6mm bore 10mm bore 16mm to 25mm bore	2.0 - 7.0 bar (28.4 - 100 psig) 1.5 - 7.0 bar (21.3 - 100 psig) 1.0 - 7.0 bar (14.2 - 100 psig)
Ambient operating temperature range	-10° C to + 60° C (14° F to + 140° F)	
Type of connection	Screwthread - M5	
Materials of construction	Cylinder body and end plate - Anodised aluminium alloy Piston rods - Stainless steel (6mm and 10mm bore) - Chrome plated steel (16mm to 25mm bore) Piston - Aluminium alloy Seals - Nitrile rubber	
Cushioning	Fixed rubber buffer at both ends of travel	
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil.	
Piston speed	50 - 300mm/sec	

Non rotating accuracy with no load, stroke 0mm

Type	Bore	Accuracy
Slide bearing type	6mm bore	±0.20°
	10mm and 16mm bore	±0.10°
	20mm and 25mm bore	±0.05°
Roller bearing type	6mm and 10mm bore	±0.15°
	16mm to 25mm bore	±0.07°



Piston rod thrust (N)

Bore	Air pressure (bar)	1.5	2.0	3.0	4.0	5.0	6.0	7.0
6mm bore	OUT	-	11.3	17.0	22.6	28.3	33.9	39.6
	IN	-	6.3	9.4	12.6	15.7	18.8	22.0
10mm bore	OUT	23.5	31.4	47.1	62.8	78.5	94.2	109.9
	IN	15.0	20.1	30.2	40.2	50.3	60.3	70.4
16mm bore	OUT	60.3	80.4	120.6	160.8	201.0	241.1	281.3
	IN	36.7	49.0	73.5	98.0	122.5	146.9	171.4
20mm bore	OUT	94.2	125.6	188.4	251.2	314.0	376.8	439.6
	IN	60.3	80.4	120.6	160.8	201.0	241.1	281.3
25mm bore	OUT	147.2	196.3	294.4	392.5	490.7	588.8	686.9
	IN	101.0	134.7	202.1	269.4	336.8	404.1	471.5

Installation dimensions	See page STR 1.3
Magnetic sensors	See page STR 2.1

Mass (kg)

Type	Model	Mass
Slide bearing type	STR-M-6-Stroke	0.060kg + 0.010kg per 10mm stroke
	STR-M-10-Stroke	0.140kg + 0.014kg per 10mm stroke
	STR-M-16-Stroke	0.240kg + 0.020kg per 10mm stroke
	STR-M-20-Stroke	0.340kg + 0.040kg per 10mm stroke
	STR-M-25-Stroke	0.580kg + 0.052kg per 10mm stroke
Roller bearing type	STR-B-6-Stroke	0.064kg + 0.010kg per 10mm stroke
	STR-B-10-Stroke	0.155kg + 0.014kg per 10mm stroke
	STR-B-16-Stroke	0.300kg + 0.020kg per 10mm stroke
	STR-B-20-Stroke	0.405kg + 0.040kg per 10mm stroke
	STR-B-25-Stroke	0.610kg + 0.052kg per 10mm stroke

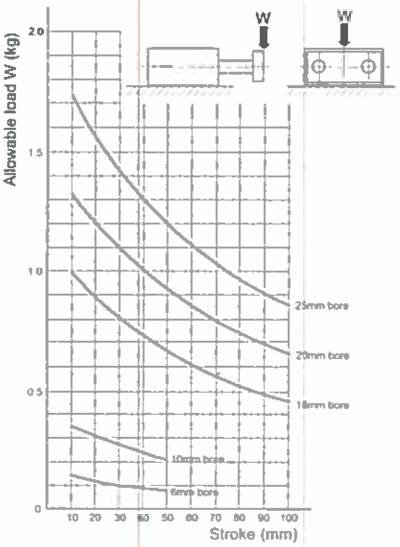
Note: *Mass shown excludes magnetic sensors. Switch mass = 0.052kg.*

Service kits

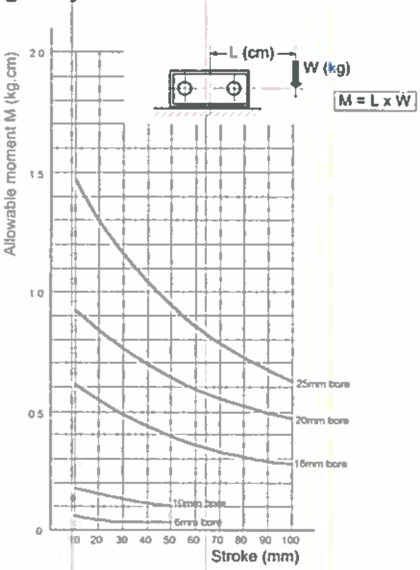
Units	Kit	Units	Kit
6mm bore units	STR - 6K	20mm bore units	STR - 20K
10mm bore units	STR - 10K	25mm bore units	STR - 25K
16mm bore units	STR - 16K		

6. Technical data

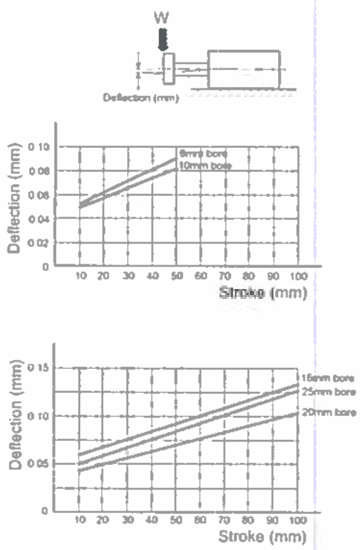
Allowable load with centre of gravity of load between twin rods



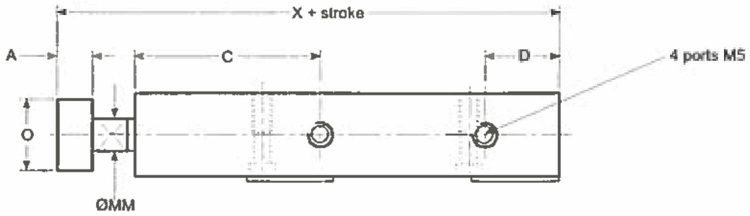
Allowable load with centre of gravity of load outside twin rods

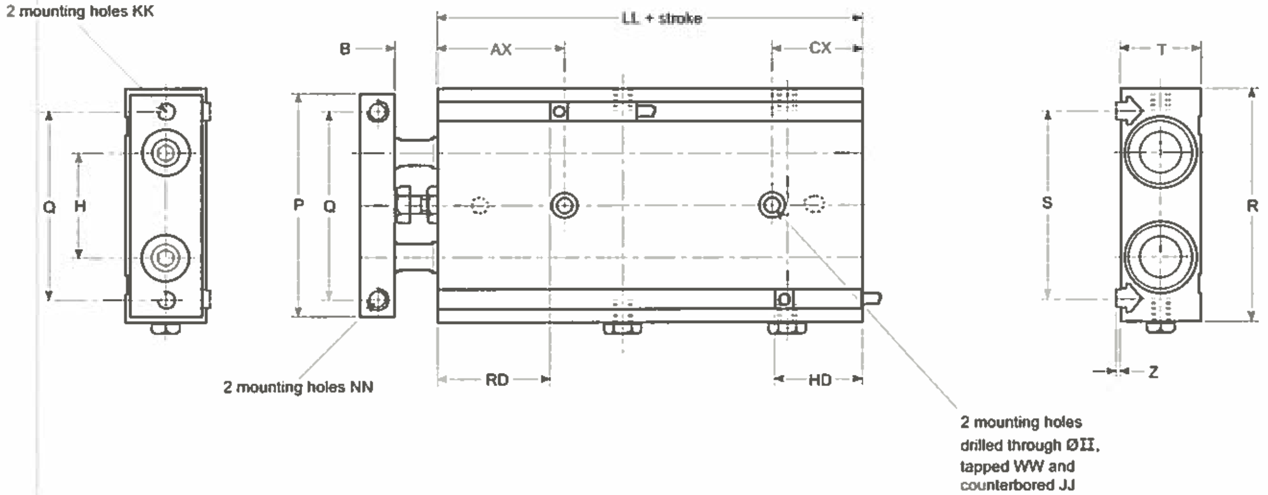


Piston rod deflection with maximum load applied



7. Installation dimensions in mm





Bore	A	AX	B	C	CX	D	H	II	JJ	KK	LL	MM	NN	O	P	Q	R	S	T	WW	X	Z
6	6	20	6	24.5	14	7.5	14	3.4	6.5Øx3.3deep	M3	44	4	M3	11	34	29	36	24	13	M4x5deep	56	2.7
10	6	24	8	35	17	7	20	4.3	8.0Øx4.4deep	M4	55	6	M4	13	42	36	44	33	15	M5x6deep	69	0.5
16	8	24	8	43	16	9.5	25	4.3	8.0Øx4.4deep	M5	66	10	M5	19	52	45	54	44	21	M5x6deep	82	0
20	10	24	10	46	18	9.5	28	5.2	9.5Øx5.4deep	M5	75	12	M5	24	60	50	62	49	27	M6x8deep	95	0
25	12	24	10	44	18	10.5	34	6.3	11.0Øx6.5deep	M6	75	14	M6	30	70	60	72	58	33	M8x8deep	97	0

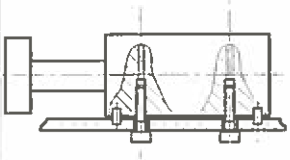
Magnetic sensor positions

Bore	Proximity Switch K3H		Reed switch K0H	
	HD	RD	HD	RD
6	25.5	18.5	26.5	17.5
10	25.5	29.5	26.5	28.5
16	28.5	37.5	29.5	36.5
20	31.0	44.0	32.0	43.0
25	32.5	42.5	33.5	41.5

NOTE:
Reed switches cannot be fitted to
6mm and 10mm bore
ROLLER BEARING units

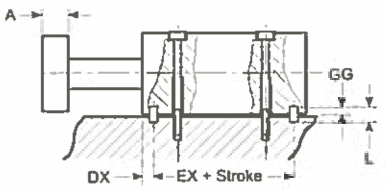
For further technical information request catalogue ref CC-N-321

8. Mounting options



EITHER
by threaded cap screws through mounting plate into tapped holes in underside of cylinder body.

Bore	Bolt dia	Depth of tapped hole in cylinder body
6	M4	5mm
10	M5	6mm
16	M5	6mm
20	M6	8mm
25	M8	8mm



OR
by bolts through cylinder body from top and screwed into tapped holes in base plate.

Bore	Bolt dia	Bolt length (minimum)
6	M3	15mm
10	M4	20mm
16	M4	25mm
20	M5	32mm
25	M6	40mm

Alternatively through bolt and nut can be used when plate mounted.

The underside of the body has 2 dowel locations for accurate positioning of unit:-

(Dimensions in mm)

Bore	DX	EX	GG	L
6	7	30	3 deep (4Ø)	8
10	8	38	4 deep (4Ø)	8
16	8	50	6 deep (6Ø)	12
20	9	57	6 deep (6Ø)	12
25	9	57	6 deep (6Ø)	12

Note:
When fastening items to threaded holes in end plate ensure that length of bolt is sufficient to give a thread engagement equal to dimension 'A'

CKD Twin rod cylinders

Magnetic sensors - Reed switch Type K0H and Proximity switch Type K3H

6, 10, 16, 20, 25mm

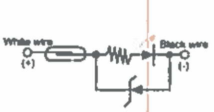
1. General description and application benefits

Continuously rated reed and proximity switches with LED indicator and flying lead. Programmable controller relay operation.

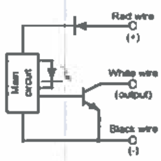
- Switches fit within cylinder body envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagrams of switches

Reed switch K0



Proximity switch K3



3. Preferred model selection

Reed switch

Model code	Description
K0H3	Axial lead wire reed switch with 3metre flying lead (Standard)
K0H5	Axial lead wire reed switch with 5 metre flying lead (Optional)

NOTE: Reed switches cannot be fitted to 6mm and 10mm bore ROLLER BEARING units

Proximity switch

Model code	Description
K3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
K3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

4. Operating data

Ambient operating temperature range	-10° C to + 60° C (14 F to + 140° F)
Load voltage/current	K0H - 12, 24vDC / 5 to 50mA 110vAC / 7 to 20mA K3H - 30vDC or less / 100mA or less
Power consumption	K3H - 24vDC (ON) 10mA or less
Leakage current	K3H - 10 μA or less
Maximum impulse	K0H - 30G K3H - 100G
Protection	IEC standard IP67
Lead wire	K0H - Oil proof 2 core vinyl cabtyre cord 0.2mm² K3H - Oil proof 3 core vinyl cabtyre cord 0.2mm²
Insulation resistance	More than 20MΩ at 500v DC megger
LED indication	Red (ON)

5. Installation requirements

Reed switch K0H*

Magnetic environment
Avoid using at places with strong magnetic field and high current (large magnet, spot welder, etc.) in the surroundings. When making proximity connection of cylinders with switches in parallel, the magnetic substance moving at the vicinity of the cylinder may cause mutual interference, affecting the detecting accuracy.

Lead wire connection
Be sure to connect the lead wire of the switch to a load in series, instead of connecting it directly to the power source.

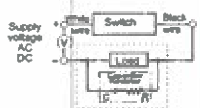
[A] For DC, white wire is the positive (+) side and the black wire the negative (-) side.
If connected inverse, the switch activates, but the lamp fails to light.

[B] To connect the lead wire to an AC relay or input terminal of the programmable controller, the lamp of the switch may not light if each circuit is half-wave rectification. In such cases reverse the polarity of the connection, then the lamp will light.

Contact capacity
Avoid using the load with the capacity exceeding the maximum contact capacity of the switch. When the current is below the rated current level, the switch lamp may fail to light.

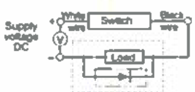
Contact protection
When using for the inductive load (such as relay, etc.), be sure to install the contact protection circuits shown below.

When using capacitor and resistance



Wired by user
Protection circuit (spark quenching circuit)
Recommended value capacitor C 0.033 - 0.1μF
Resistor R 1 - 3KΩ
By Okaya Denki XEB#0 or equivalent

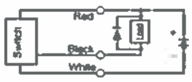
When using diode



Wired by user
Protection General rectifier diode By Hitachi V06 or equivalent

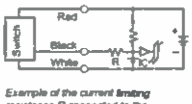
Proximity switch K3H*

Output circuit protection



Example of surge absorbing element (diode) jointly used as the inductive load Use Hitachi diode V06 or equivalent

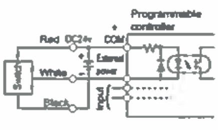
When an inductive load (relay or solenoid valve) is connected, be sure to install the protection circuit shown left in order to protect from the surge voltage generated when the switch is turned OFF.



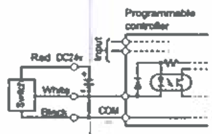
Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0.10 = R (Ω)

When a capacitive load (condenser) is connected, be sure to install the protection circuit shown left in order to protect from the inrush current generated when the switch is turned ON.

Connection to programmable controller (sequencer)
The connecting method differs according to the type of programmable controller.
Make connections as shown below.

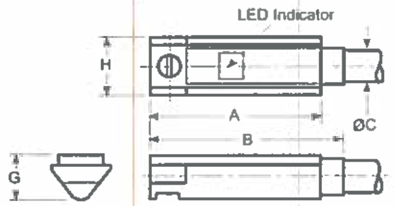


Example of switch K3H connection to source input (external power) type*



Example of switch K3H connection to source input (built - in power) type The switch cannot be connected to the sink input sequencer.*

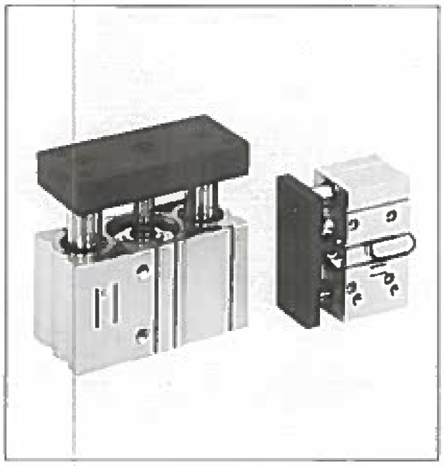
6. Installation dimensions in mm



Model code	A	B	C	G	H
K0H*	24	26.5	3.4	4.5	7.0
K3H*	24	26.5	3.4	4.5	7.0

CKD Rod guided cylinder

Double acting - STS / STL series
20, 25, 32, 40, 50, 63, 80mm bore



1. General description and application benefits

Compact, lightweight double acting rod guided cylinders available in short stroke or long stroke versions with slide bearings or roller bearings.
Twin guide rods arranged and joined in parallel with piston rod ensures non rotating action.

- High resistance to side load.
- High speed.
- Space saving.
- High non rotating accuracy.
- Magnetic piston standard.
- Small switches fit within body envelope.
- Side or bottom mounting positions.
- Ports in top or side (20mm to 63mm bore).

2. Functional symbol

For further technical information request catalogue ref CC-N-322

3. Model code

S T * - * - * * - * * *

[1] [2] [3] [4]

[1] **Series**
S = Short stroke
L = Long stroke

[2] **Type**
M = Slide bearing
B = Roller bearing

[3] **Bore**
20 = 20mm
25 = 25mm
32 = 32mm
40 = 40mm
50 = 50mm
63 = 63mm
80 = 80mm

[4] **Stroke**
See preferred tables below.

Note: For all bore sizes
Minimum stroke = 5mm
Maximum stroke = 200mm
Intermediate strokes, in increments of 5mm, are available to special order - Total cylinder length in such cases is equal to that of next standard stroke.

Preferred model selection

Short stroke - slide bearing type

Bore	Model code	Stroke 25	50	75	100	125	150	175	200
20mm	STS - M - 20 - Stroke	■	■						
25mm	STS - M - 25 - Stroke	■	■						
32mm	STS - M - 32 - Stroke	■	■						
40mm	STS - M - 40 - Stroke	■	■						
50mm	STS - M - 50 - Stroke	■	■						
63mm	STS - M - 63 - Stroke	■	■						
80mm	STS - M - 80 - Stroke	■	■	■	■				

Long stroke - slide bearing type

Bore	Model code	Stroke 25	50	75	100	125	150	175	200
20mm	STL - M - 20 - Stroke			■	■	■	■	■	■
25mm	STL - M - 25 - Stroke			■	■	■	■	■	■
32mm	STL - M - 32 - Stroke			■	■	■	■	■	■
40mm	STL - M - 40 - Stroke			■	■	■	■	■	■
50mm	STL - M - 50 - Stroke			■	■	■	■	■	■
63mm	STL - M - 63 - Stroke			■	■	■	■	■	■
80mm	STL - M - 80 - Stroke					■	■	■	■

Short stroke - roller bearing type

Bore	Model code	Stroke 25	50	75	100	125	150	175	200
20mm	STS - B - 20 - Stroke	■	■						
25mm	STS - B - 25 - Stroke	■	■						
32mm	STS - B - 32 - Stroke	■	■						
40mm	STS - B - 40 - Stroke	■	■						
50mm	STS - B - 50 - Stroke	■	■						
63mm	STS - B - 63 - Stroke	■	■						
80mm	STS - B - 80 - Stroke	■	■	■	■				

Long stroke - roller bearing type

Bore	Model code	Stroke 25	50	75	100	125	150	175	200
20mm	STL - B - 20 - Stroke			■	■	■	■	■	■
25mm	STL - B - 25 - Stroke			■	■	■	■	■	■
32mm	STL - B - 32 - Stroke			■	■	■	■	■	■
40mm	STL - B - 40 - Stroke			■	■	■	■	■	■
50mm	STL - B - 50 - Stroke			■	■	■	■	■	■
63mm	STL - B - 63 - Stroke			■	■	■	■	■	■
80mm	STL - B - 80 - Stroke					■	■	■	■

4. Operating data

Operating pressure	20mm and 25mm bore	1.53 - 10.2 bar (21.8 - 145 psig)
	32mm to 80mm bore	1.02 - 10.2 bar (14.5 - 145 psig)
Ambient operating temperature range	-10⁰ C to + 60⁰ C (14⁰ F to + 140⁰ F)	
Type of connection	20mm and 25mm bore	M5 x 0.8
	32mm and 40mm bore	1/8"
	50mm and 63mm bore	1/4"
	80mm bore	3/8"
Materials of construction	Cylinder body and end plate - Anodised aluminium alloy Piston rod - Stainless steel (20mm and 25mm bore) - Chrome plated steel (32mm to 80mm bore) Piston - Aluminium alloy Seals - Nitrile rubber Guide rods - Chrome plated steel	
Cushioning	Fixed rubber buffer at both ends	
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil.	
Piston speed	20mm to 50mm bore	50 - 500mm/sec
	63mm and 80mm bore	50 - 300mm/sec

Piston rod thrust (N)

	Air pressure (bar)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
20mm bore	OUT	-	63	94	126	157	188	220	251	283
	IN	-	47	71	94	118	142	165	189	212
25mm bore	OUT	-	98	147	196	245	294	343	393	442
	IN	-	76	113	151	189	227	264	302	340
32mm bore	OUT	80	161	241	322	402	487	563	643	774
	IN	60	121	181	241	302	362	422	482	543
40mm bore	OUT	126	251	377	502	678	754	879	1005	1130
	IN	100	200	301	401	501	601	701	802	902
50mm bore	OUT	196	393	589	785	982	1178	1374	1570	1767
	IN	165	330	495	660	825	989	1154	1319	1484
63mm bore	OUT	311	623	934	1246	1557	1869	2180	2492	2804
	IN	280	560	840	1120	1400	1680	1961	2241	2512
80mm bore	OUT	492	984	1477	1969	2462	2954	3446	3939	4431
	IN	444	888	1332	1777	2221	2665	3110	3553	3997

Installation dimensions	See pages STS 1.5 - 6
Magnetic sensors	See pages STS 2.1 - 2

Mass (kg)

	Stroke	25	50	75	100	125	150	175	200
Slide bearing type	ST*-M-20-Stroke	0.71	0.86	1.11	1.26	1.41	1.56	1.71	1.86
	ST*-M-25-Stroke	0.78	0.95	1.23	1.39	1.56	1.73	1.90	2.07
	ST*-M-32-Stroke	1.32	1.55	2.10	2.33	2.56	2.79	3.02	3.25
	ST*-M-40-Stroke	1.81	2.09	2.70	2.98	3.26	3.54	3.83	4.11
	ST*-M-50-Stroke	2.87	3.30	4.43	4.86	5.29	5.71	6.14	6.57
	ST*-M-63-Stroke	3.89	4.45	5.59	6.15	6.70	7.26	7.82	8.38
	ST*-M-80-Stroke	9.03	10.30	11.56	12.83	15.47	16.73	18.00	19.26
Roller bearing type	ST*-B-20-Stroke	0.59	0.74	0.97	1.12	1.27	1.42	1.57	1.72
	ST*-B-25-Stroke	0.66	0.83	1.09	1.26	1.42	1.59	1.76	1.93
	ST*-B-32-Stroke	1.20	1.43	1.91	2.14	2.37	2.60	2.84	3.07
	ST*-B-40-Stroke	1.69	1.97	2.51	2.79	3.08	3.36	3.64	3.92
	ST*-B-50-Stroke	2.76	3.19	4.07	4.50	4.93	5.35	5.78	6.21
	ST*-B-63-Stroke	3.66	4.21	5.23	5.79	6.34	6.90	7.46	8.02
	ST*-B-80-Stroke	8.48	9.63	10.78	11.93	14.13	15.28	16.43	17.58

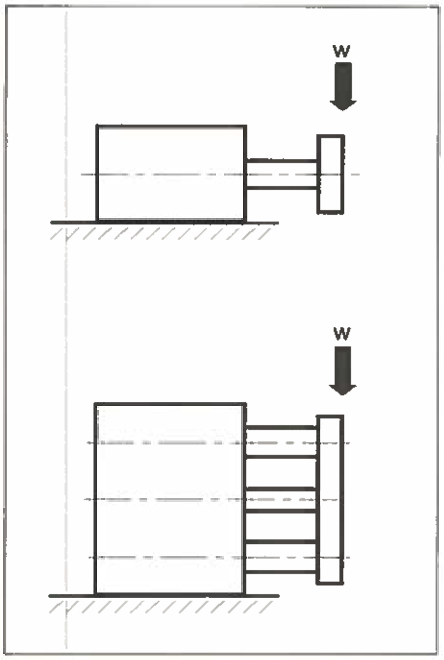
Note: *Mass shown excludes magnetic sensors. Switch mass = 0.02kg*

Service kits

20mm bore units	STS - 20K
25mm bore units	STS - 25K
32mm bore units	STS - 32K
40mm bore units	STS - 40K
50mm bore units	STS - 50K
63mm bore units	STS - 63K
80mm bore units	STS - 80K

5. Technical data

Maximum side force



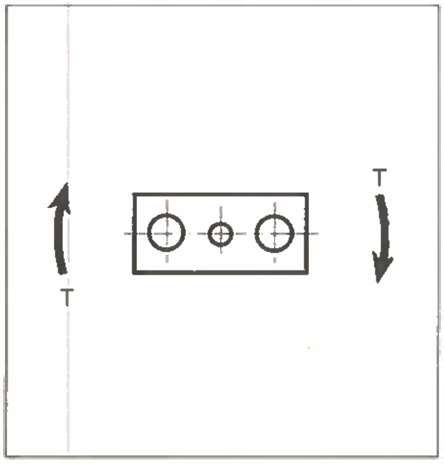
Slide bearing models

Bore	Series	Force (W in N) for stroke 25	50	75	100	125	150	175	200
20 & 25	STS	78	59						
	STL			49	39	34	29	27	20
32 & 40	STS	216	167						
	STL			127	108	96	88	78	69
50 & 63	STS	324	255						
	STL			196	177	159	147	132	118
80	STS	539	461	403	348				
	STL					503	467	435	407

Roller bearing models

Bore	Series	Force (W in N) for stroke 25	50	75	100	125	150	175	200
20 & 25	STS	59	39						
	STL			196	127	105	88	75	69
32 & 40	STS	88	59						
	STL			216	196	170	147	140	118
50 & 63	STS	137	88						
	STL			353	304	260	235	210	196
80	STS	470	385	327	283				
	STL					963	875	802	740

Maximum rotational torque



Slide bearing models

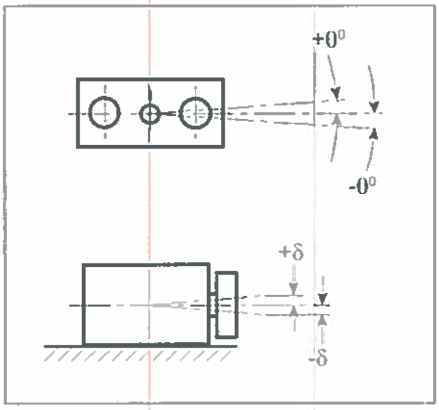
Bore	Series	Torque T (in Nm) for stroke 25	50	75	100	125	150	175	200
20	STS	1.08	0.88						
	STL			0.69	0.49	0.44	0.39	0.29	0.20
25	STS	1.15	0.94						
	STL			0.74	0.52	0.47	0.42	0.31	0.21
32	STS	4.32	3.33						
	STL			2.55	2.16	3.90	1.77	1.20	1.37
40	STS	4.81	3.73						
	STL			3.04	2.84	2.40	1.96	1.70	1.47
50	STS	8.83	6.96						
	STL			5.39	4.81	4.40	4.02	3.60	3.24
63	STS	10.00	7.85						
	STL			6.08	5.39	4.90	4.51	4.00	3.63
80	STS	20.20	17.30	15.11	13.05				
	STL					18.86	17.50	16.31	15.26

Roller bearing models

Bore	Series	Torque T (in Nm) for stroke 25	50	75	100	125	150	175	200
20	STS	0.78	0.49						
	STL			1.96	1.86	1.50	1.27	1.10	0.98
25	STS	0.83	0.52						
	STL			2.09	1.98	1.60	1.35	1.17	1.04
32	STS	1.77	1.18						
	STL			4.32	3.92	3.40	2.94	2.60	2.35
40	STS	1.96	1.27						
	STL			4.81	4.41	3.80	3.24	2.90	2.65
50	STS	3.73	2.35						
	STL			9.71	8.34	7.40	6.47	5.90	5.39
63	STS	4.22	2.65						
	STL			10.89	9.41	8.30	7.26	6.60	6.08
80	STS	17.63	14.44	12.26	10.61				
	STL					36.11	32.81	30.08	27.75

5. Technical data - continued

Positional accuracy

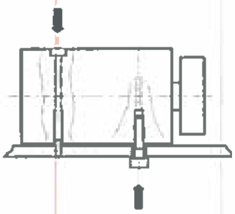


Bore	Model	θ°	δmm
20 & 25	Slide bearing	±0.10	±0.05
	Roller bearing	±0.05	±0.03
32 & 40	Slide bearing	±0.08	±0.06
	Roller bearing	±0.04	±0.04
50, 63 & 80	Slide bearing	±0.06	±0.07
	Roller bearing	±0.03	±0.05

Note: Above values are with piston rod in retracted position

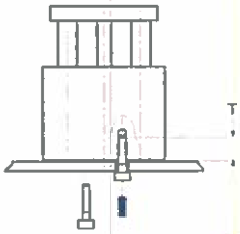
6. Mounting options

Side mounting



EITHER
by threaded cap screws through mounting plate into tapped holes in underside of cylinder body
OR
by bolts through cylinder body from top and screwed into tapped holes in base plate (alternatively bolt and nut can be used).

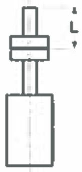
Bottom mounting



Threaded cap screws through mounting plate into tapped holes in cylinder end plate.

For 'Stopper' applications fixing screws must have an engagement length 'T' of at least twice screw diameter and must be prevented from loosening (i.e. use spring washers or adhesive).

'Stopper' applications

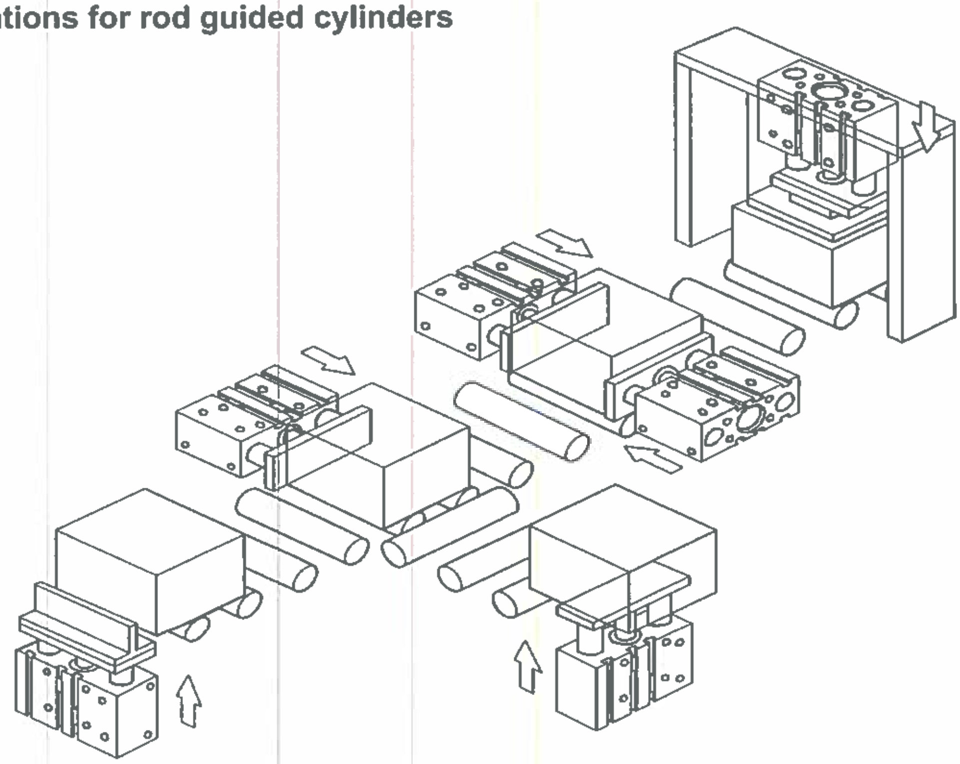


ONLY short stroke, slide bearing models (STS-M-**-25 or STS-M-**-50) are to be used for 'stopper' applications.

The length of the 'stopper' (L) should be 50mm or less.

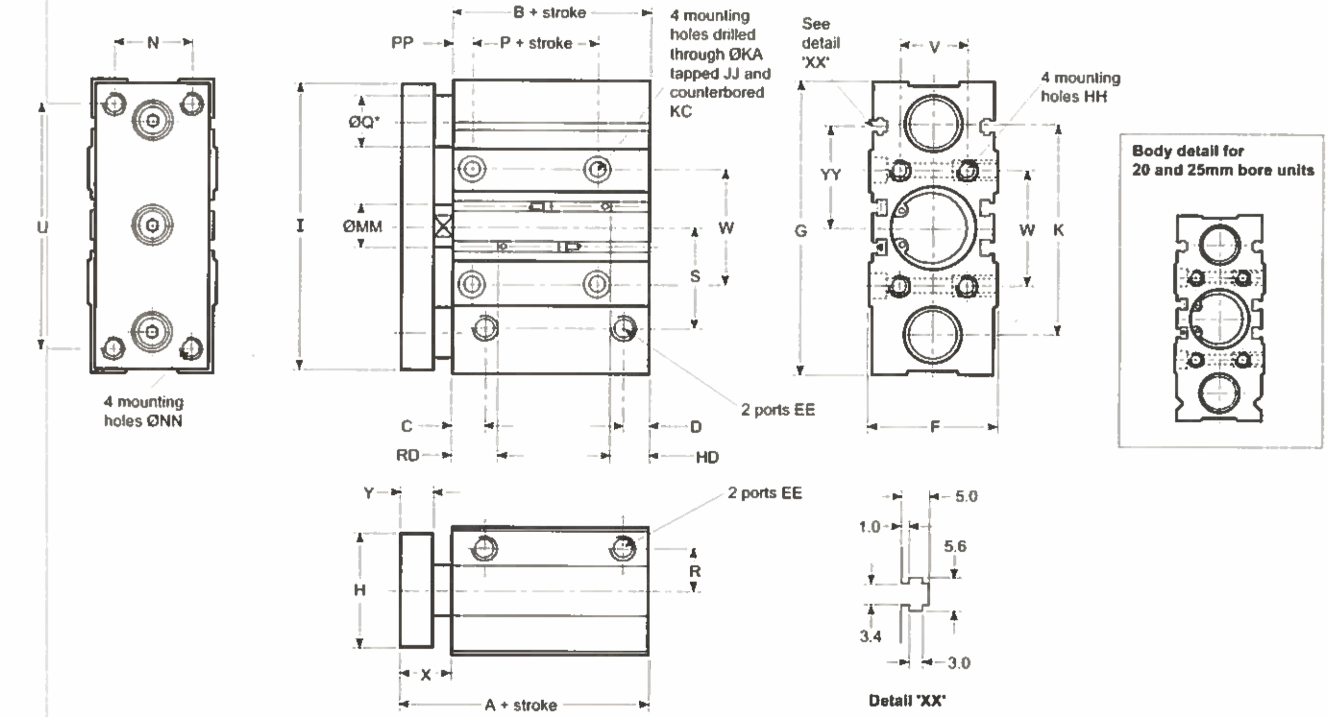
Ensure correct fixing is used (see left).

7. Typical applications for rod guided cylinders

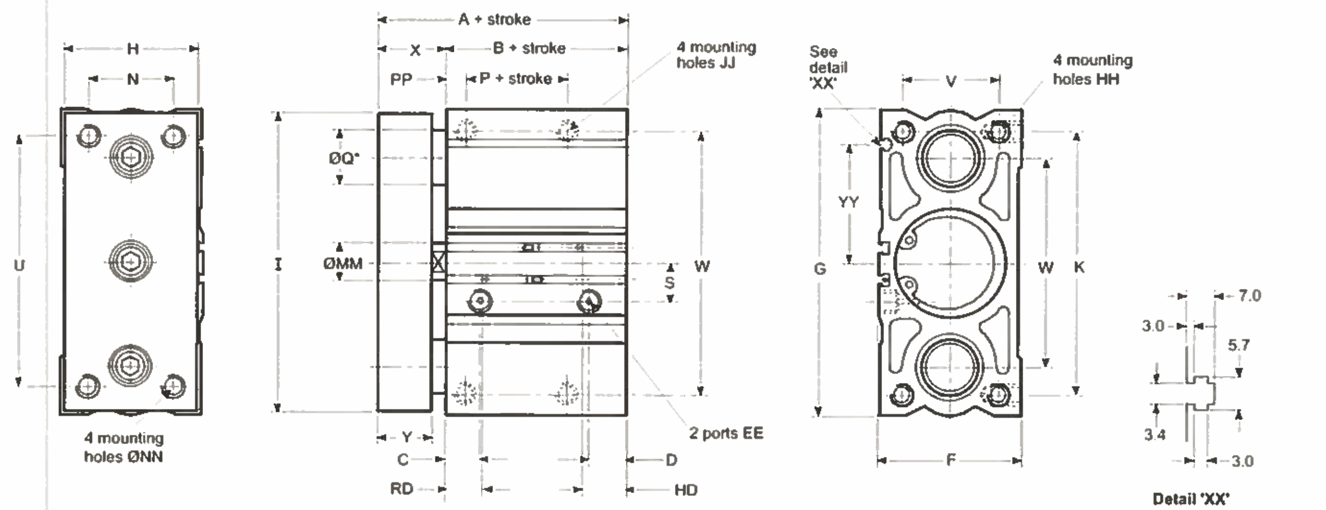


8. Installation dimensions in mm - Short stroke models

20, 25, 32, 40, 50, 63mm bore



80mm bore



Bore	A	B	C	D	EE	F	G	H	HH	I	JJ	K	KA	KC	MM
20	53	40	12	8	M5	38	83	36	M6x12deep	81	M6x12deep	59	5.2	9.5Øx5.4deep	10
25	54	41	12	9	M5	42	86	38	M6x12deep	84	M6x12deep	63	5.2	9.5Øx5.4deep	12
32	68	49	14	10.5	1/8"	47	111	45	M8x16deep	109	M8x16deep	81	6.3	11Øx6.5deep	16
40	72	53	14.5	11.5	1/8"	54	120	50	M8x16deep	118	M8x16deep	90	6.3	11Øx6.5deep	16
50	77	55	16	12.5	1/4"	66	147	64	M10x20deep	145	M10x20deep	110	8.6	14Øx8.6deep	20
63	83	61	17.5	17.5	1/4"	79	162	75	M10x20deep	160	M10x20deep	124	8.6	14Øx8.6deep	20
80	119	79	25	26	3/8"	98	220	90	M16x16deep	212	M16x16deep	150	-	-	25

Bore	N	NN	P	PP	Q1*	Q2*	R	S	U	V	W	X	Y	YY	RD	HD
20	24	M6	20	6	14	12	13	24	69	20	31	13	9	25	12.0	9.5
25	26	M6	20	6	14	12	14	26	72	24	35	13	9	27	13.0	9.0
32	29	M8	22	7	20	16	16	39	93	25	45	19	12	39	17.5	13.5
40	34	M8	25	7	20	16	18	43	102	32	54	19	12	42	21.0	14.0
50	44	M10	26	8	25	20	22	49	125	38	66	22	16	49	22.0	16.0
63	55	M10	26	8	25	20	26	56	140	50	79	22	16	56	20.0	23.0
80	60	M16	22	15	40	35	-	29	180	68	190	40	25	85	26.5	30.5

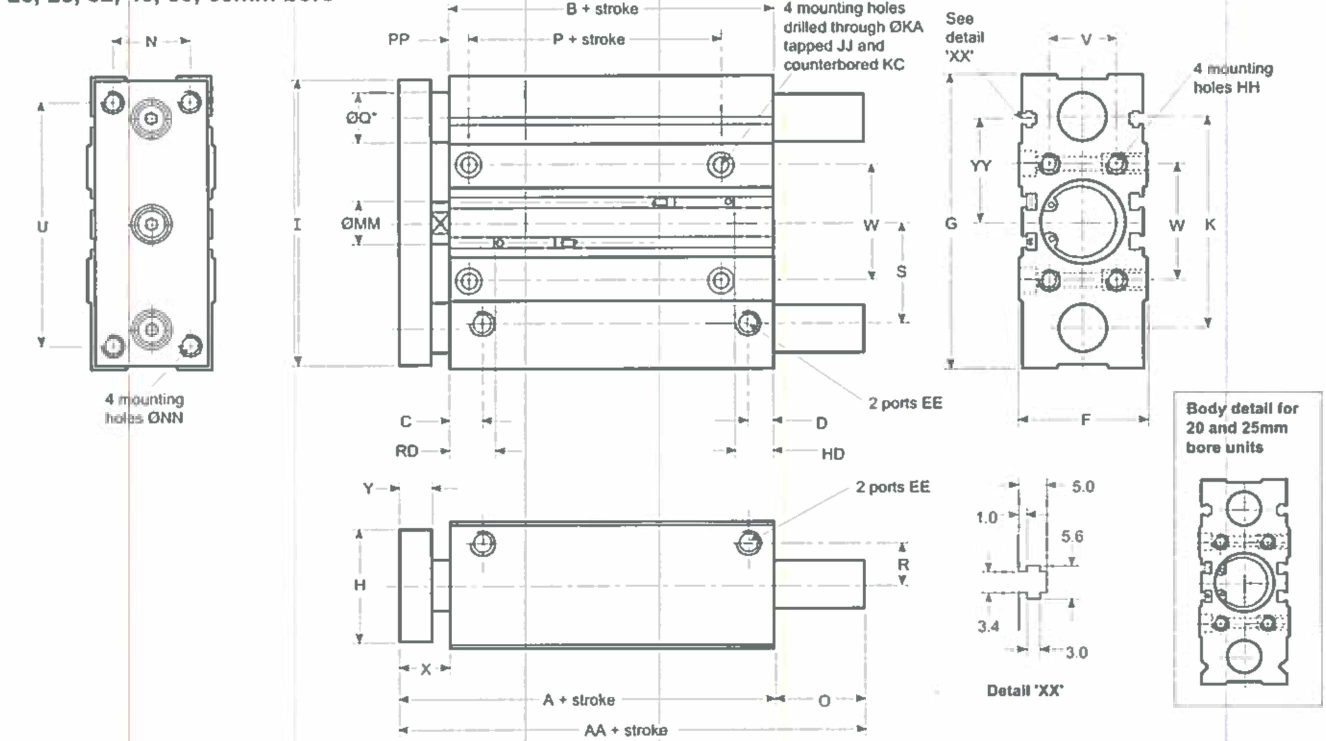
Notes:

- * *Dimension Q1 is for cylinder with slide bearing. Dimension Q2 is for cylinder with roller bearing.*

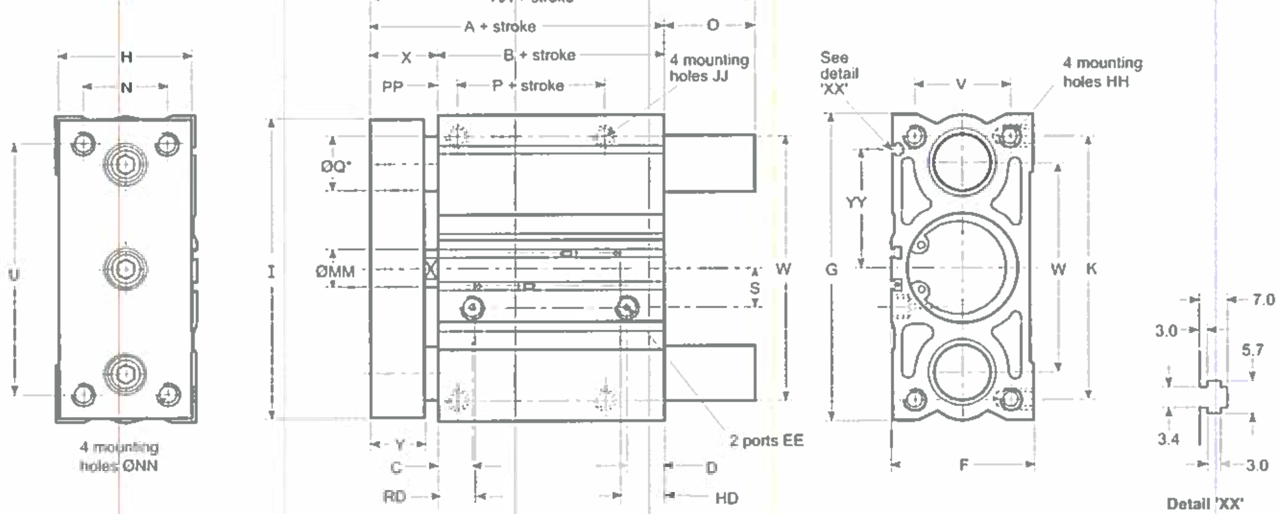
Dimensions RD and HD are magnetic sensor positions.

9. Installation dimensions in mm - Long stroke models

20, 25, 32, 40, 50, 63mm bore



80mm bore



Bore	A	AA	B	C	D	EE	F	G	H	HH	I	JJ	K	KA	KC	MM
20	53	72	40	12	8	M5	38	83	36	M6x12deep	81	M6x12deep	59	5.2	9.5Øx5.4deep	10
25	54	72	41	12	9	M5	42	86	38	M6x12deep	84	M6x12deep	63	5.2	9.5Øx5.4deep	12
32	68	102	49	14	10.5	1/8"	47	111	45	M8x16deep	109	M8x16deep	81	6.3	11Øx6.5deep	16
40	72	102	53	14.5	11.5	1/8"	54	120	50	M8x16deep	118	M8x16deep	90	6.3	11Øx6.5deep	16
50	77	125	55	16	12.5	1/4"	66	147	64	M10x20deep	145	M10x20deep	110	8.6	14Øx8.6deep	20
63	83	125	61	17.5	17.5	1/4"	79	162	75	M10x20deep	160	M10x20deep	124	8.6	14Øx8.6deep	20
80	119	186	79	25	26	3/8"	98	220	90	M16x16deep	212	M16x16deep	150	-	-	25

Bore	N	NN	O	P	PP	Q1*	Q2*	R	S	U	V	W	X	Y	YY	RD	HD
20	24	M6	19	20	6	14	12	13	24	69	20	31	13	9	25	12.0	9.5
25	26	M6	18	20	6	14	12	14	26	72	24	35	13	9	27	13.0	9.0
32	29	M8	34	22	7	20	16	16	39	93	25	45	19	12	39	17.5	13.5
40	34	M8	30	25	7	20	16	18	43	102	32	54	19	12	42	21.0	14.0
50	44	M10	48	26	8	25	20	22	49	125	38	66	22	16	49	22.0	16.0
63	55	M10	42	26	8	25	20	26	56	140	50	79	22	16	56	20.0	23.0
80	60	M16	67	22	15	40	35	-	29	180	68	190	40	25	85	26.5	30.5

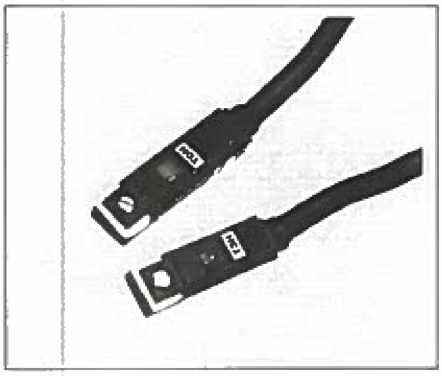
Notes:
- * *Dimension Q1 is for cylinder with slide bearing. Dimension Q2 is for cylinder with roller bearing.*

Dimensions RD and HD are magnetic sensor positions.

VICKERS **Pneumatics**

CKD Rod guided cylinders

Magnetic sensors - Proximity switch Type T3H and Reed switch Type T0H
20, 25, 32, 40, 50, 63, 80mm



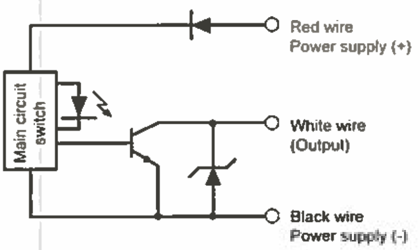
1. General description and application benefits

Continuously rated proximity and reed switches with LED indicator and flying lead.
Programmable controller relay operation.

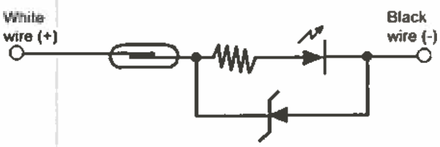
- Switches fit within cylinder body envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagrams of switches

Proximity switch T3H3



Reed switch T0H3



3. Preferred model selection

Proximity switch

Model code	Description
T3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
T3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

Reed switch

Model code	Description
T0H3	Axial lead wire reed switch with 3metre flying lead (Standard)
T0H5	Axial lead wire reed switch with 5 metre flying lead (Optional)

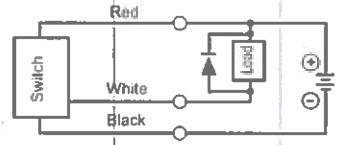
4. Operating data

Ambient operating temperature range	-10° C to + 60° C (14 F to + 140° F)
Load voltage/current	T3H3 - 30vDC or less/100mA or less T0H3 - 12, 24vDC/ 5 to 25mA 110vAC/ 7 to 20mA
Power consumption	T3H3 - 24vDC (ON) 10mA or less
Leakage current	T3H3 - 10 µA or less
Maximum impulse	T3H3 - 100G T0H3 - 30G
Protection	IEC standard IP67
Lead wire	T3H3 - Oil proof 3 core vinyl cabtyre cord 0.2mm^2 T0H3 - Oil proof 2 core vinyl cabtyre cord 0.2mm^2
Insulation resistance	More than 20MΩ at 500v DC megger
LED indication	Red (ON)

5. Installation requirements

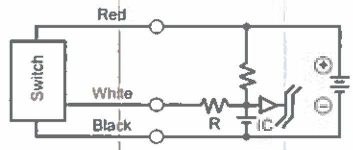
Proximity switch T3H*

Output circuit protection
When an inductive load (relay or solenoid valve) is connected, be sure to install the protection circuit shown below in order to protect from the surge voltage generated when the switch is turned OFF.



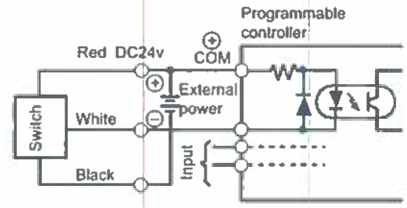
Example of surge absorbing element (diode) jointly used as the inductive load. Use Hitachi diode V06 or equivalent

When a capacitive load (condenser) is connected, be sure to install the protection circuit shown below in order to protect from the inrush current generated when the switch is turned ON.

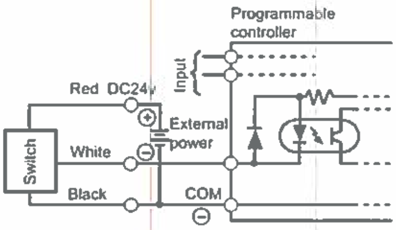


Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0.10 = R (Ω)

Connection to programmable controller (sequencer)
The connecting method differs according to the type of programmable controller.
Make connections as shown below.



Example of switch T3H3 connection to source input (external power) type.



Example of switch T3H3 connection to source input (built - in power) type.
The switch cannot be connected to the sink input sequencer.

Reed switch T0H*

Magnetic environment
Avoid using at places with strong magnetic field and high current (large magnet, spot welder, etc.) in the surroundings. When making proximity connection of cylinders with switches in parallel, the magnetic substance moving at the vicinity of the cylinder may cause matual interference, affecting the detecting accuracy.

Lead wire connection
Be sure to connect the lead wire of the switch to a load in series, instead of connecting it directly to the power source.

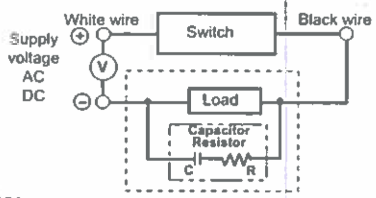
A For DC, white wire is the positive (+) side and the black wire the negative (-) side.
If connected inverse, the switch activates, but the lamp fails to light.

B To connect the lead wire to an AC relay or input terminal of the programmable controller , the lamp of the switch may not light if each circuit is half-wave rectification. In such cases reverse the polarity of the connection, then the lamp will light.

Contact capacity
Avoid using the load with the capacity exceeding the maximum contact capacity of the switch. When the current is below the rated current level, the switch lamp may fail to light.

Contact protection
When using for the inductive load (such as relay, etc.), be sure to install the contact protection circuits shown below.

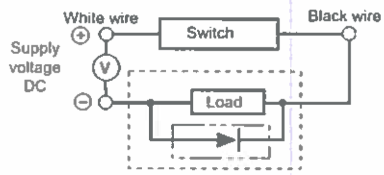
- When using capacitor and resistance



Wired by user

Protection circuit (spark quenching circuit)
Recommended value capacitor C 0.033 - 0.1μF
Resistor R 1 - 3KΩ
By Okaya Denki XEBIKI or equivalent

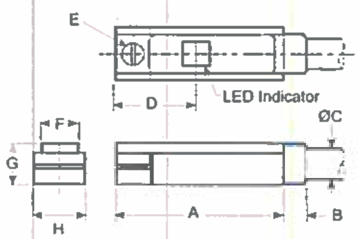
- When using diode



Wired by user

Protection
General rectifier diode
By Hitachi V06 or equivalent

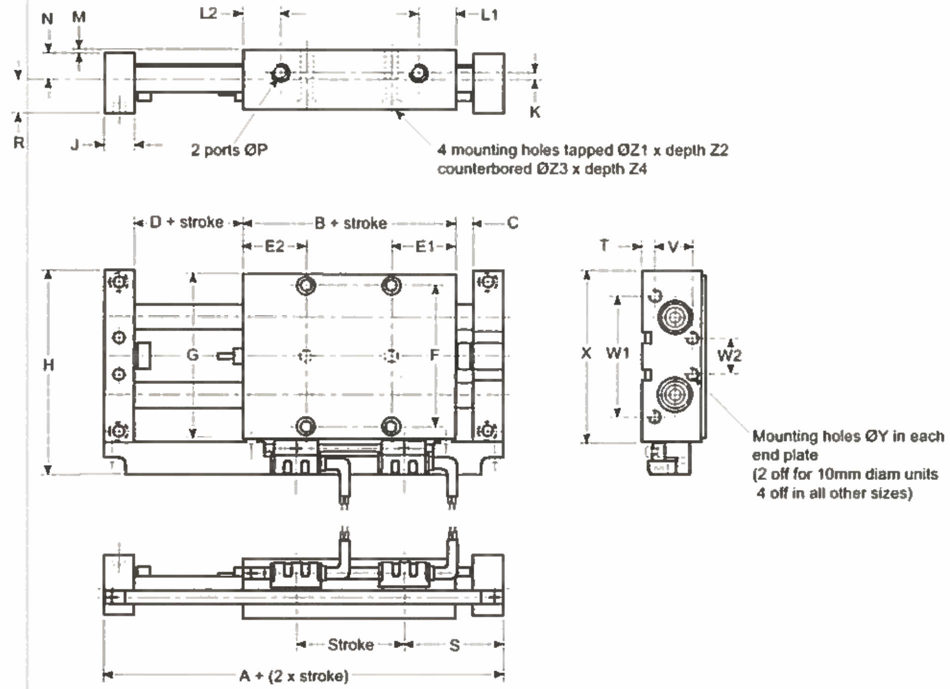
6. Installation dimensions in mm

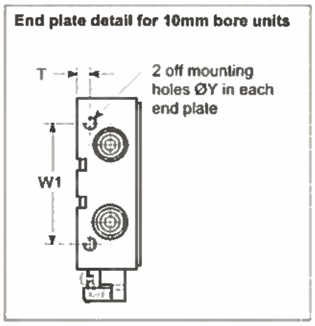


Model code	A	B	C	D	E	F	G	H
T3H3	18.5	2.5	3.4	9	M2.5	4.5	4.7	6
T0H3	22.5	2.5	3.4	9	M2.5	4.5	4.7	6

7. Installation dimensions in mm - Slide bearing models

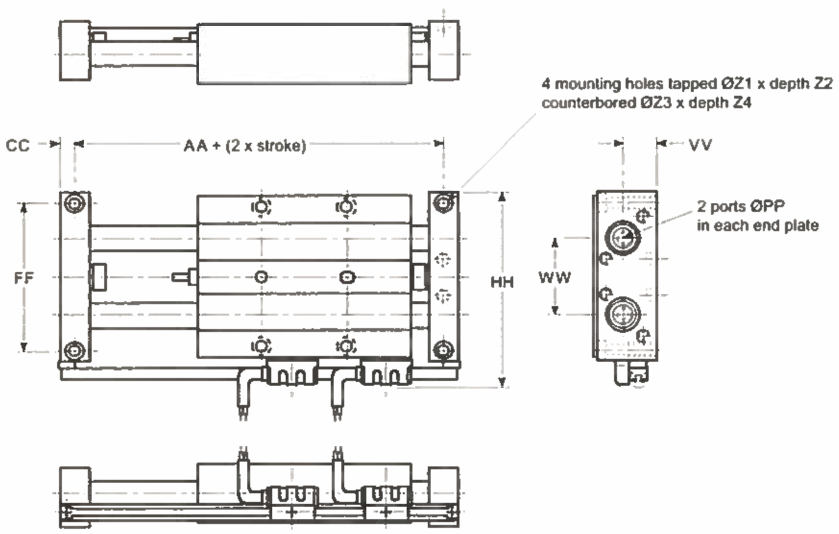
Body fixed (X)

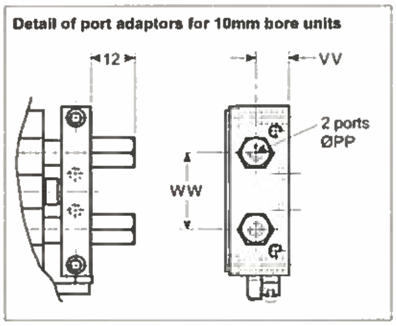


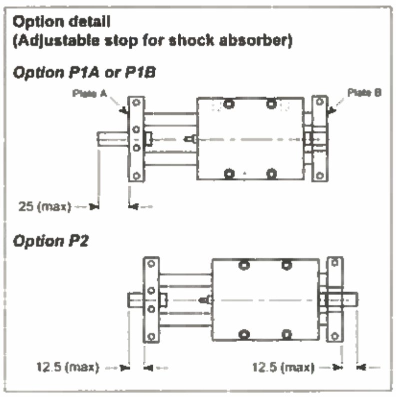


Bore	A	B	C	D	E1	E2	F	G	H	J	K	L1	L2	M	N	P	R	S	T	V	W1	W2	X	Y	Z1	Z2	Z3	Z4
10	84	54	5	5	28	28	42	50	66	10	2	20	20	2	7	M5	12	40.5	4	-	35	-	54	M4	M4	8	6.5	3.3
16	92	50	9	9	23	23	58	68	84	12	0.5	17	17	2	10	M5	14	44.5	5	15	48	14	72	M4	M5	10	8	4.4
25	112	62	9	9	35	35	76	88	104	16	0	20	20	2	14	1/8"	18	54.5	7	21	64	24	92	M6	M6	12	9.5	5.4
32	125	75	9	9	35	35	102	118	134	16	9	25	25	2	17	1/8"	21	61	6	25	80	30	122	M6	M8	16	11	6.5

End plate fixed (Y)





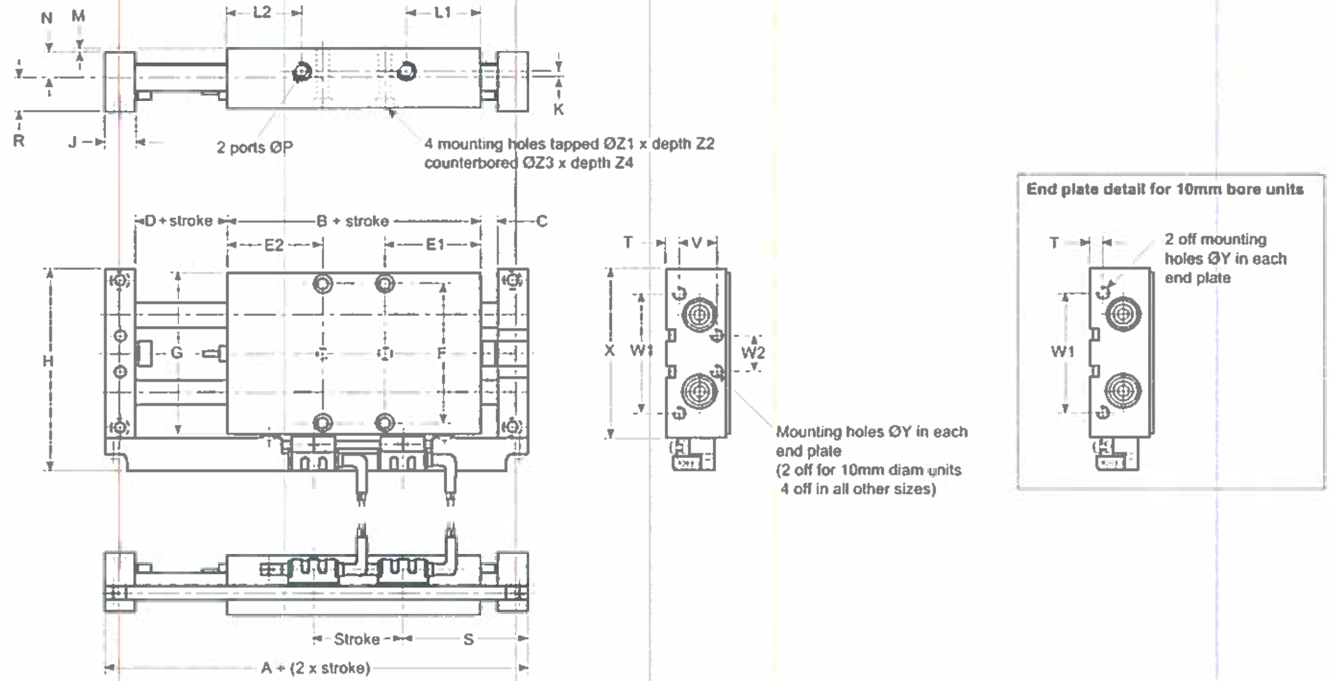


Bore	AA	CC	FF	HH	PP	VV	WW	Z1	Z2	Z3	Z4
10	75	4.5	45	66	M5	12	26	M4	8	6.5	3.3
16	80	6	60	84	M5	14	34	M5	10	8	4.4
25	96	8	80	104	1/8"	18	42	M6	12	9.5	5.4
32	109	8	102	134	1/8"	21	58	M8	16	11	6.5

All other dimensions as for body fixed version above.

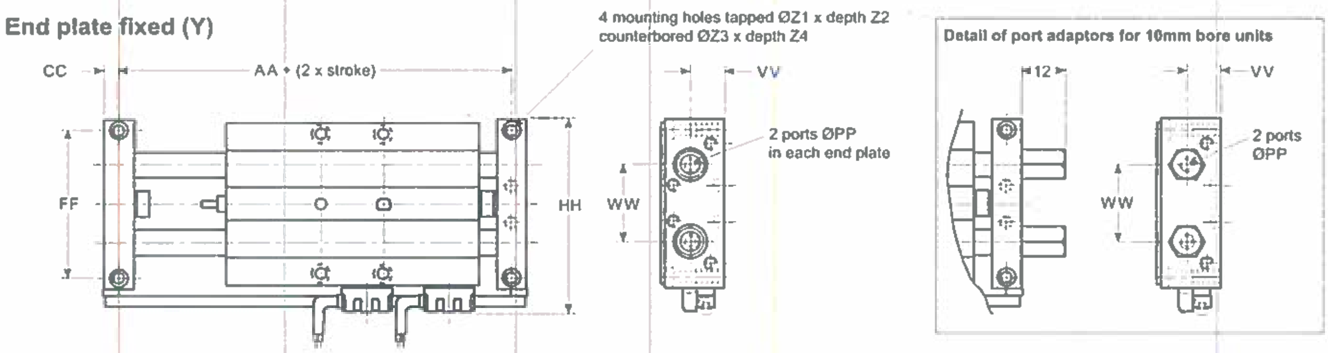
8. Installation dimensions in mm - Roller bearing models

Body fixed (X)



Bore	A	B	C	D	E1	E2	F	G	H	J	K	L1	L2	M	N	P	R	S	T	V	W1	W2	X	Y	Z1	Z2	Z3	Z4
10	106	76	5	5	39	39	42	50	66	10	2	31	31	2	7	M5	12	51.5	4	-	35	-	54	M4	M4	8	6.5	3.3
16	138	96	9	9	46	46	58	68	84	12	0.5	40	40	2	10	M5	14	67.5	5	15	48	14	72	M4	M5	10	8	4.4
25	146	96	9	9	52	52	76	88	104	16	0	42.5	42.5	2	14	1/8"	18	71.5	7	21	64	24	92	M6	M6	12	9.5	5.4
32	164	114	9	9	54.5	54.5	102	118	134	16	9	42	42	2	17	1/8"	21	80.5	6	25	80	30	122	M6	M8	16	11	6.5

End plate fixed (Y)



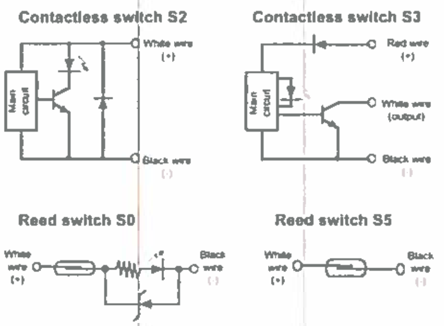
Bore	AA	CC	FF	HH	PP	VV	WW	Z1	Z2	Z3	Z4
10	97	4.5	45	66	M5	12	26	M4	8	6.5	3.3
16	126	6	60	84	M5	14	34	M5	10	8	4.4
25	130	8	80	104	1/8"	18	42	M6	12	9.5	5.4
32	148	8	102	134	1/8"	21	58	M8	16	11	6.5

All other dimensions as for body fixed version above.

Dimensions for adjustable stop for shock absorber option detailed on page UCA2 1.3.

9. Magnetic sensors

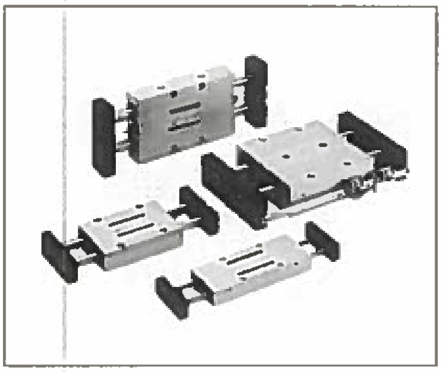
Circuit diagrams



Switch type	Contactless switch S2	S3	Reed switch S0	S5
Application	PC	PC, relay, IC, small solenoid	PC, relay	PC, relay, IC, serial connection
Ambient operating temperature range		-10° C to + 60° C (14° F to + 140° F)		
Supply voltage	-	4.5-28vDC	-	-
Load voltage/current	10-30vDC 5-30mA	< 30vDC < 200mA	24vDC/5-50mA 100vAC/7-20mA	24vDC/< 50mA 100vAC/< 20mA
Current consumption	-	<10mA with 24vDc	-	-
Internal voltage drop	<4v	<0.5v	<2.4v	0
Leakage current	<1mA	<10μA	0	0
Protection		IEC standard IP67		
Lead wire (oilproof PVC cabtyre cord)	2core 0.2mm²	3core 0.15mm²	2core 0.2mm²	2core 0.2mm²
Insulation resistance		100M ohm or greater		
LED indication	Red (ON)	Red (ON)	Red (ON)	No lamp

CKD Slide unit - Unit cylinder

Double acting - UCA2 series
10, 16, 25, 32mm bore



1. General description and application benefits

Compact, lightweight double acting slide units (unit cylinders) available in slide bearing or roller bearing versions. Twin rods arranged and joined in parallel ensures non rotating action. Installation can be rod driving with body fixed or body driving with end plates fixed.

- Lightweight.
- High speed.
- High power - Twice thrust of conventional cylinder.
- 2 installation options.
- Lube free.
- Soft stop by integral shock absorber - **Standard.**
- Magnetic piston option for reed or proximity switches operation.
- Suitable for simple robotic applications.

2. Functional symbol

For further technical information request catalogue ref CB-04

3. Model code

UCA2 - * - * - * - * - * - * - * - *
[1] [2] [3] [4] [5] [6] [7] [8]

[1] Type
No mark = Slide bearing
B = Roller bearing

[2] Piston
No mark = Non magnetic
L = Magnetic

[3] Fixing method
X = Body fixed
Y = End plate fixed

[4] Bore
10 = 10mm
16 = 16mm
25 = 25mm
32 = 32mm

[5] Stroke
See preferred tables below

[6] Switch type
S0* = Reed 2 wire
S5* = Reed 2 wire
S2* = Proximity 2 wire
S3* = Proximity 3 wire (NPN)
Note: * = Lead wire length
No mark = 1 metre (Standard)
3 = 3 metre (Option)
5 = 5 metre (Option)
(For specifications see page UCA2 1.4)

[7] Switch quantity
RA = 1 on plate A side
RB = 1 on plate B side
D = 2 off
T = 3 off
Note: Shortest stroke required for switch installation
1 off = 10mm
2 off = 20mm
3 off = 75mm

[8] Options
P1A = Adjustable stop for shock absorber at plate A
P1B = Adjustable stop for shock absorber at plate B
P2 = Adjustable stop for shock absorber at both ends

Preferred model selection

Slide bearing type - non magnetic piston

Bore	Model code	Stroke 25	50	75	100	125	150	175	200
10mm	UCA2-*-10-Stroke-*	■	■	■	■				
16mm	UCA2-*-16-Stroke-*	■	■	■	■	■	■	■	■
25mm	UCA2-*-25-Stroke-*	■	■	■	■	■	■	■	■
32mm	UCA2-*-32-Stroke-*	■	■	■	■	■	■	■	■

Slide bearing type - magnetic piston

Bore	Model code	Stroke 25	50	75	100	125	150	175	200
10mm	UCA2-L-*-10-Stroke-*-*-*	■	■	■	■				
16mm	UCA2-L-*-16-Stroke-*-*-*	■	■	■	■	■	■	■	■
25mm	UCA2-L-*-25-Stroke-*-*-*	■	■	■	■	■	■	■	■
32mm	UCA2-L-*-32-Stroke-*-*-*	■	■	■	■	■	■	■	■

Roller bearing type - non magnetic piston

Bore	Model code	Stroke 25	50	75	100	125	150	175	200
10mm	UCA2-B-*-10-Stroke-*	■	■	■	■				
16mm	UCA2-B-*-16-Stroke-*	■	■	■	■	■	■	■	■
25mm	UCA2-B-*-25-Stroke-*	■	■	■	■	■	■	■	■
32mm	UCA2-B-*-32-Stroke-*	■	■	■	■	■	■	■	■

Roller bearing type - magnetic piston

Bore	Model code	Stroke 25	50	75	100	125	150	175	200
10mm	UCA2-B-L-*-10-Stroke-*-*-*	■	■	■	■				
16mm	UCA2-B-L-*-16-Stroke-*-*-*	■	■	■	■	■	■	■	■
25mm	UCA2-B-L-*-25-Stroke-*-*-*	■	■	■	■	■	■	■	■
32mm	UCA2-B-L-*-32-Stroke-*-*-*	■	■	■	■	■	■	■	■

Ordering example:-
UCA2-B-L-X-16-150-S3-D-P2 = 16mm bore, 150mm stroke roller bearing type unit slide with magnetic piston and fitted with 2 NPN switches (1m lead wire) and adjustable shock absorber stops at both ends.

4. Operating data

Operating pressure	10mm and 16mm bore 25mm and 32mm bore	1.5 - 10.2 bar (21.3 - 145 psig) 1.0 - 10.2 bar (14.2 - 145 psig)
Ambient operating temperature range	-10° C to + 60° C (14° F to + 140° F)	
Type of connection	10mm and 16mm bore 25mm and 32mm bore	M5 x 0.8 1/8"
Materials of construction	Cylinder body - Anodised aluminium alloy Piston rods - Chrome plated steel Piston - Aluminium alloy Seals - Nitrile rubber	
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil.	
Piston speed	30 - 300mm/sec	
Maximum loads at 5 bar (71 psig) Slide bearing and roller bearing types	Body fixed 10mm bore - 0.7kg 16mm bore - 2.0kg 25mm bore - 3.5kg 32mm bore - 5.0kg	Plate fixed 10mm bore - 1.5kg 16mm bore - 4.0kg 25mm bore - 7.0kg 32mm bore - 10.0kg
Non rotating accuracy with no load, stroke 0mm (Piston rod bending not included)	Slide bearing type Roller bearing type	10mm and 16mm bore ±0.05 25mm and 32mm bore ±0.02 10mm bore ±0.04 16mm bore ±0.03 25mm and 32mm bore ±0.015

Piston rod thrust (N)

Air pressure (bar)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
10mm bore	10	20	29	39	49	59	69	78	88
16mm bore	25	48	73	96	121	145	169	193	217
25mm bore	66	132	198	265	330	396	463	528	594
32mm bore	119	236	355	474	591	710	828	946	1065

Installation dimensions	See pages UCA2 1.3 - 4.
Magnetic sensors	See pages UCA2 1.1 and UCA2 1.4.

Mass (kg)

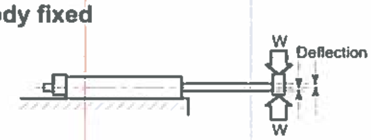
	Stroke (mm)	25	50	75	100	125	150	175	200
Slide bearing type	UCA2-*-10-Stroke	0.35	0.42	0.49	0.55				
	UCA2-*-16-Stroke	0.56	0.71	0.84	0.98	1.12	1.25	1.39	1.52
	UCA2-*-25-Stroke	1.04	1.26	1.47	1.68	1.89	2.11	2.32	2.53
	UCA2-*-32-Stroke	1.69	2.01	2.31	2.62	2.93	3.24	3.55	3.85
Roller bearing type	UCA2-B-*-10-Stroke	0.41	0.47	0.54	0.61				
	UCA2-B-*-16-Stroke	0.85	0.98	1.11	1.25	1.38	1.51	1.65	1.78
	UCA2-B-*-25-Stroke	1.37	1.58	1.79	2.01	2.22	2.43	2.75	2.85
	UCA2-B-*-32-Stroke	2.26	2.57	2.87	3.18	3.49	3.79	4.10	4.40

***Note:** Mass shown includes switch mounting rail. Switch mass = 0.03kg.*

Service kits	10mm bore units UCA2-10K, 16mm bore units UCA2-16K, 25mm bore units UCA2-25K, 32mm bore units UCA2-32K

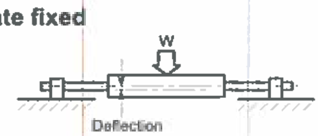
5. Piston rod deflection caused by concentrated load

Body fixed



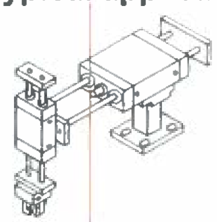
Bore	Max load W (kg)	Deflection in mm for stroke (mm) 25	50	75	100	125	150	175	200
10	0.7	0.04	0.10	0.18	0.27				
16	2.0	0.03	0.07	0.12	0.20	0.28	0.37	0.48	0.60
25	3.5	0.02	0.04	0.08	0.13	0.17	0.24	0.32	0.41
32	5.0	0.01	0.03	0.06	0.10	0.14	0.21	0.29	0.38

Plate fixed

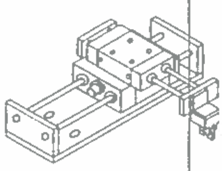


Bore	Max load W (kg)	Deflection in mm for stroke (mm) 75	100	125	150	175	200
10	1.5	0.05	0.10				
16	4.0	0.02	0.05	0.09	0.16	0.25	0.38
25	7.0	0.01	0.03	0.06	0.10	0.16	0.24
32	10.0	0.005	0.02	0.04	0.07	0.11	0.15

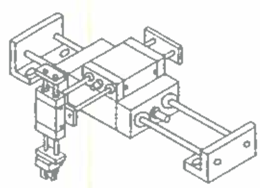
6. Typical applications for slide units, unit cylinders



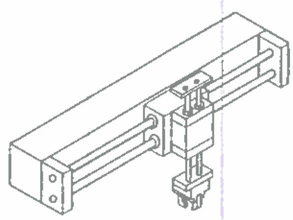
2 axis pick and place



2 axis X-Y table



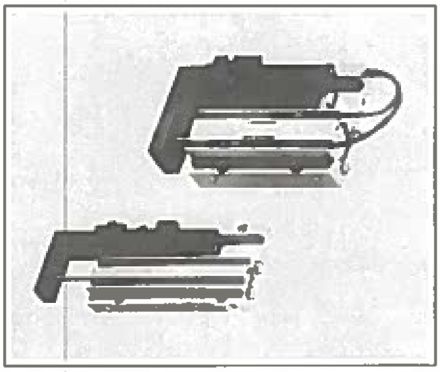
3 axis X-Y-Z table



2 axis long stroke pick and place

CKD Linear slide cylinder

Double acting - LCY series
10, 16, 20, 25mm bore

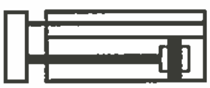


1. General description and application benefits

Compact, lightweight double acting cylinders with linear slide bearing. Cylinder rod and linear slide arranged and joined in parallel ensuring high precision non rotating action.

- Lightweight slim design.
- High accuracy.
- Stroke limiter.
- Magnetic piston standard.
- Small switches fit within main body.
- Optional port positions.
- Direct mounting - flexible fixing.
- Integral air connections available for operation of auxiliary components.

2. Functional symbol



3. Model code

LCY - * - * * - * * *

[1] [2] [3]

[1] Type
No mark = Standard unit
A = Unit with integrated piping

[2] Bore
10 = 10mm
16 = 16mm
20 = 20mm
25 = 25mm

[3] Stroke
See preferred tables below

Preferred model selection

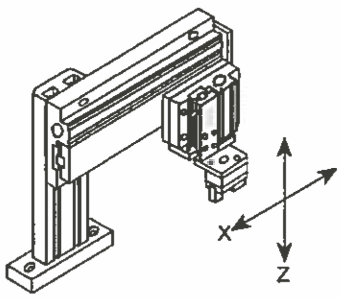
Standard unit

Bore	Model code	Stroke 15	30	50	75	100
10mm	LCY - 10 - Stroke	■	■	■		
16mm	LCY - 16 - Stroke	■	■	■	■	■
20mm	LCY - 20 - Stroke	■	■	■	■	■
25mm	LCY - 25 - Stroke	■	■	■	■	■

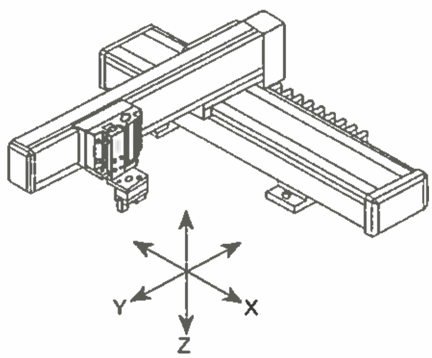
Unit with integrated piping

Bore	Model code	Stroke 15	30	50	75	100
10mm	LCY - A - 10 - Stroke	■	■	■		
16mm	LCY - A - 16 - Stroke	■	■	■	■	■
20mm	LCY - A - 20 - Stroke	■	■	■	■	■
25mm	LCY - A - 25 - Stroke	■	■	■	■	■

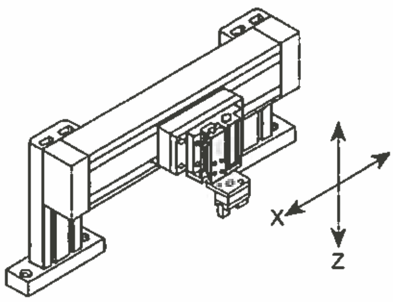
4. Typical applications for linear slide cylinders



2 axis pick and place type operation



3 axis robot operation



2 axis gate type pick and place unit

5. Operating data

Property	Value	
Operating pressure	LCY series LCY-A series	1.53 - 7.0 bar (21.8 - 100 psig) 2.04 - 7.0 bar (29.0 - 100 psig)
Proof pressure	10.2 bar (145 psig)	
Ambient operating temperature range	-10° C to + 60° C (14° F to + 140° F)	
Type of connection	Screwthread - M5	
Materials of construction	Cylinder body and end plate - Anodised aluminium alloy Piston rods - Stainless steel Piston - Aluminium alloy Seals - Nitrile rubber	
Cushioning	Fixed rubber buffer at both ends of travel	
Operating medium	Compressed air, filtered and non lubricated. If installed in lubricated system use ISO VG 32 mineral oil.	
Stroke adjustment	0 to -5mm	

Piston rod thrust (N)

	Air pressure (bar)	1.5	2.0	3.0	4.0	5.0	6.0	7.0
10mm bore	OUT	12	16	24	31	39	47	55
	IN	9.9	13	20	26	33	40	46
16mm bore	OUT	30	40	60	80	101	121	141
	IN	26	35	52	69	86	104	121
20mm bore	OUT	47	63	94	126	157	188	220
	IN	40	53	79	106	132	158	185
25mm bore	OUT	74	98	147	196	245	295	344
	IN	62	82	124	165	206	247	289

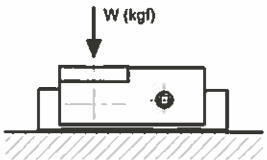
Property	Value	
Piston speed	50 - 300 mm/sec	
Allowable loadings	See page LCY 1.3	
Installation dimensions	LCY series - see page LCY 1.4 LCY-A series - see pages LCY 1.5 - 6	
Magnetic sensors	See pages LCY 2.1 - 2	
Mass (kg)	LCY-10-Stroke	0.137kg + 0.020kg per 10mm stroke
	LCY-16-Stroke	0.282kg + 0.027kg per 10mm stroke
	LCY-20-Stroke	0.501kg + 0.042kg per 10mm stroke
	LCY-25-Stroke	0.764kg + 0.057kg per 10mm stroke
	LCY-A-10-Stroke	0.138kg + 0.020kg per 10mm stroke
	LCY-A-16-Stroke	0.283kg + 0.027kg per 10mm stroke
	LCY-A-20-Stroke	0.502kg + 0.042kg per 10mm stroke
	LCY-A-25-Stroke	0.765kg + 0.057kg per 10mm stroke
Service kits	LCY-10-Stroke	LCY-10K
	LCY-16-Stroke	LCY-16K
	LCY-20-Stroke	LCY-20K
	LCY-25-Stroke	LCY-25K
	LCY-A-10-Stroke	LCY-A-10K
	LCY-A-16-Stroke	LCY-A-16K
	LCY-A-20-Stroke	LCY-A-20K
	LCY-A-25-Stroke	LCY-A-25K

Note: Mass shown excludes magnetic sensors. Switch mass = 0.052kg.

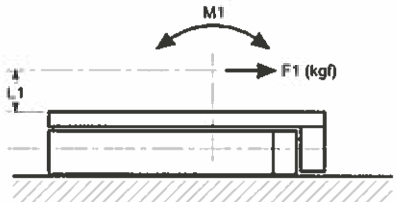
For further technical information request catalogue ref CC-N-324

6. Technical data - allowable loads

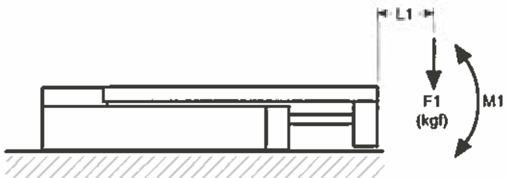
Vertical load - W



Bending moment - M1

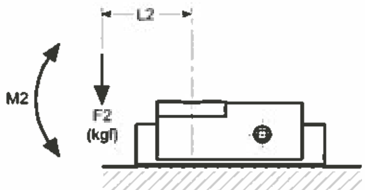


M1 = F1 x (L1 + Lb)

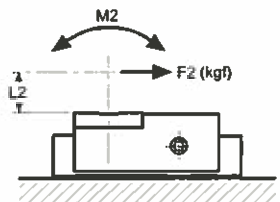


M1 = F1 x (L1 + La + stroke)

Radial moment - M2

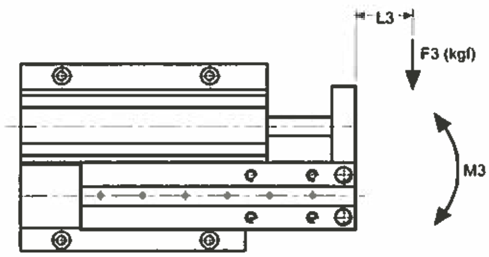


M2 = F2 x L2

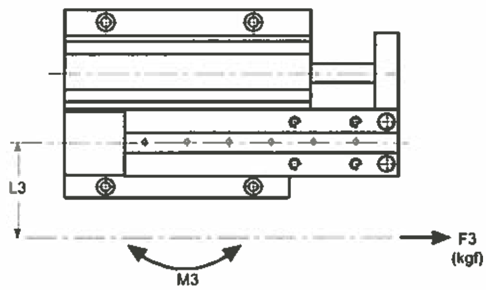


M2 = F2 x (L2 + Lb)

Cross moment - M3



M3 = F3 x (L3 + La + stroke)



M3 = F3 x L3

1) Calculate Load (W) and Moments (M1, M2, M3) for all loads.

2) Divide all values by the maximum allowable load as given in table below and check that the total load/moment ratio is 1.0 or less.

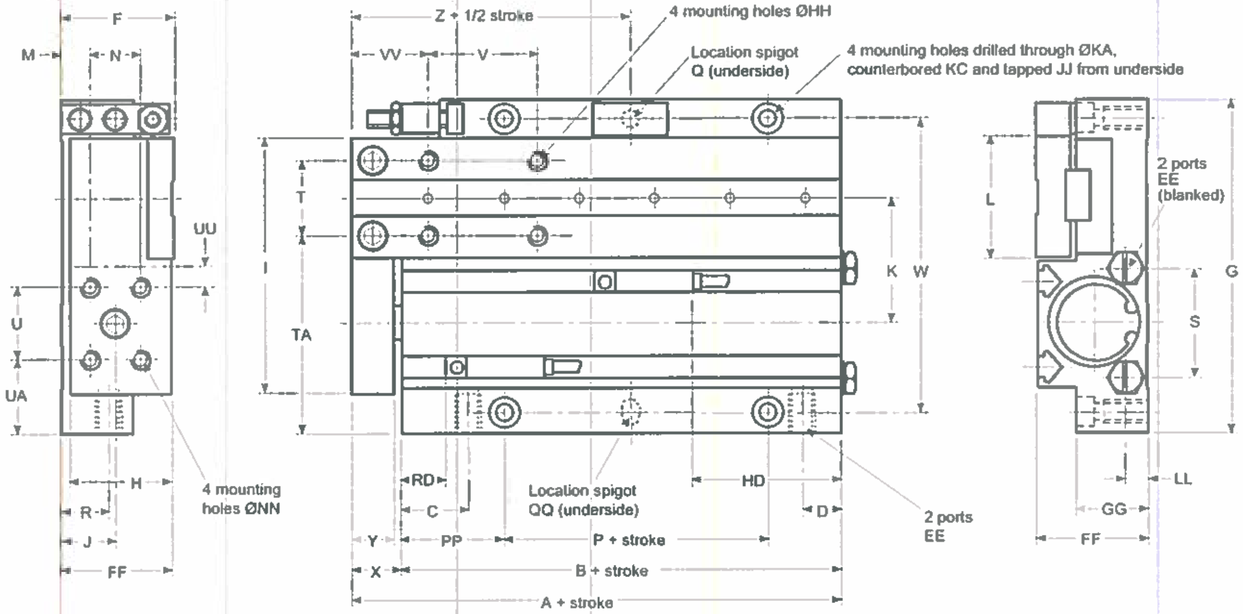
$$\frac{W}{W\ max} + \frac{M1}{M1\ max} + \frac{M2}{M2\ max} + \frac{M3}{M3\ max} \leq 1.0$$

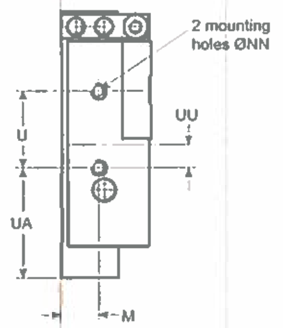
Maximum allowable load

Bore mm	Vertical load W (kg)	Bending moment M1 (Kg.m)	Radial moment M2 (kg.m)	Cross moment M3 (kg.m)	La mm	Lb mm
10	0.4	0.06	0.06	0.03	34	9
16	1.0	0.12	0.12	0.06	41	11.5
20	1.8	0.18	0.18	0.09	47	12
25	2.7	0.36	0.36	0.18	57	15

7. Installation dimensions in mm - LCY series

10, 16, 20, 25mm bore



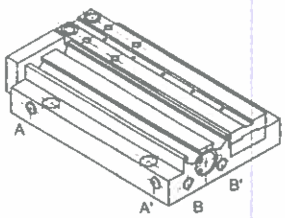


End plate detail for 10mm and 16mm bore units

All other details and dimensions as above

Porting details

Sketch showing alternative port positions



Model	Port position	Application
All models	A & A'	Cylinder operation
All models	B & B'	Cylinder operation

Bore	A	B	C	D	EE	F	FF	G	GG	H	HH	I	J	JJ	K	KA	KC
10	62	53	14	7.5	M5 x 0.8	18	17	56	11	15	M3 x 6deep	42.5	9.5	M4 x 6deep	21	3.4	6.5Ø x 3.3deep
16	75	66	11.5	7.5	M5 x 0.8	21	20	68	13	19	M4 x 7deep	51	10	M5 x 7.5deep	25.5	4.3	8.0Ø x 4.4deep
20	85	73	16	9	M5 x 0.8	27	26	80	17	24	M4 x 8deep	60	13	M5 x 8deep	30	4.3	8.0Ø x 4.4deep
25	102	88	17	11	M5 x 0.8	33	32	88	20	30	M5 x 10deep	67	16	M6 x 10deep	33.5	5.2	9.5Ø x 5.4deep

Bore	L	LL	M	N	NN	P	PP	Q	QQ	R	S	T	TA	U	UA	UU
10	19	5.5	8	-	M3 x 8deep	18	21	4Ø x 4deep	4Ø x 4deep x 5long	7.2	17	12	33.5	16	23.5	4.5
16	21	5.5	8	-	M4 x 8deep	30	20	6Ø x 6deep	6Ø x 6deep x 7long	9	24	14	42	18	31	3
20	28	5.5	6	14	M4 x 10deep	32	24	6Ø x 6deep	6Ø x 6deep x 7long	12	25	18	47	20	16	4
25	34	5.5	8	16	M5 x 12deep	38	25	6Ø x 6deep	6Ø x 6deep x 7long	14	28	22	49.5	22	16	6

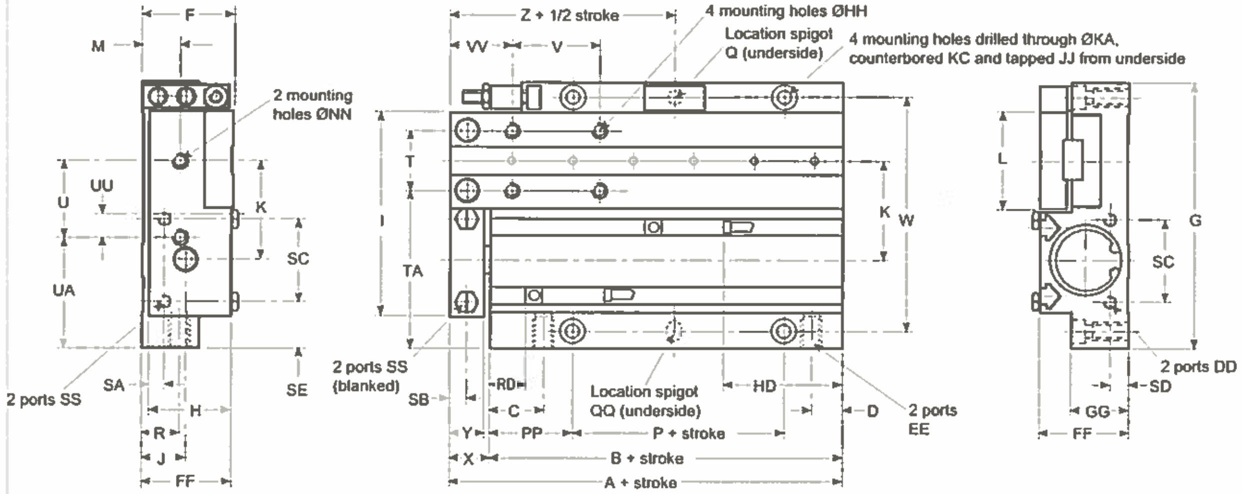
Bore	V	VV	W	X	Y	Z
10	14	14	48.5	9	8	39
16	19	15	59	9	8	44
20	26	16	70	12	10	52
25	26	16	77	14	12	58

Magnetic sensor positions

Bore	Reed Switch KOH		Proximity switch K3H	
	HD	RD	HD	RD
10	21.0	8.0	20.0	9.0
16	31.5	10.5	30.5	11.5
20	35.5	13.5	34.5	14.5
25	50.0	14.0	49.0	15.0

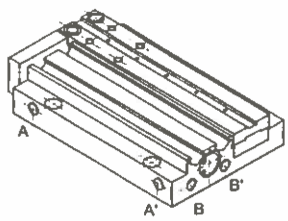
8. Installation dimensions in mm - LCY-A series (Integral piping)

10, 16mm bore



Porting details

Sketch showing port arrangement



Model	Port position	Application
LCY-A-10-*	A & A' B & B'	Cylinder operation Integral piping connections for actuation of items fitted to end plate (grippers etc)
LCY-A-16-*	A & A' B & B'	Cylinder operation Integral piping connections for actuation of items fitted to end plate (grippers etc)

Bore	A	B	C	D	DD	EE	F	FF	G	GG	H	HH	I	J	JJ	K
10	62	53	14	7.5	M5 x 0.8	M5 x 0.8	18	17	56	11	15	M3 x 6deep	42.5	9.5	M4 x 6deep	21
16	75	66	11.5	7.5	M5 x 0.8	M5 x 0.8	21	20	68	13	19	M4 x 7deep	51	10	M5 x 7.5deep	25.5

Bore	KA	KC	L	M	NN	P	PP	Q	QQ	R	SA	SB	SC	SD	SE
10	3.4	6.5Ø x 3.3deep	19	8	M3 x 8deep	18	21	4Ø x 4deep	4Ø x 4deep x 5long	7.2	5.5	3.5	17	5.5	10
16	4.3	8.00Ø x 4.4deep	21	8	M4 x 8deep	30	20	6Ø x 6deep	6Ø x 6deep x 7long	9	5.5	3.5	24	5.5	11.5

Bore	SS	T	TA	U	UA	UU	V	VV	W	X	Y	Z
10	M3 x 3deep	12	33.5	16	23.5	4.5	14	14	48.5	9	8	39
16	M3 x 3 deep	14	42	18	31	3	19	15	59	9	8	44

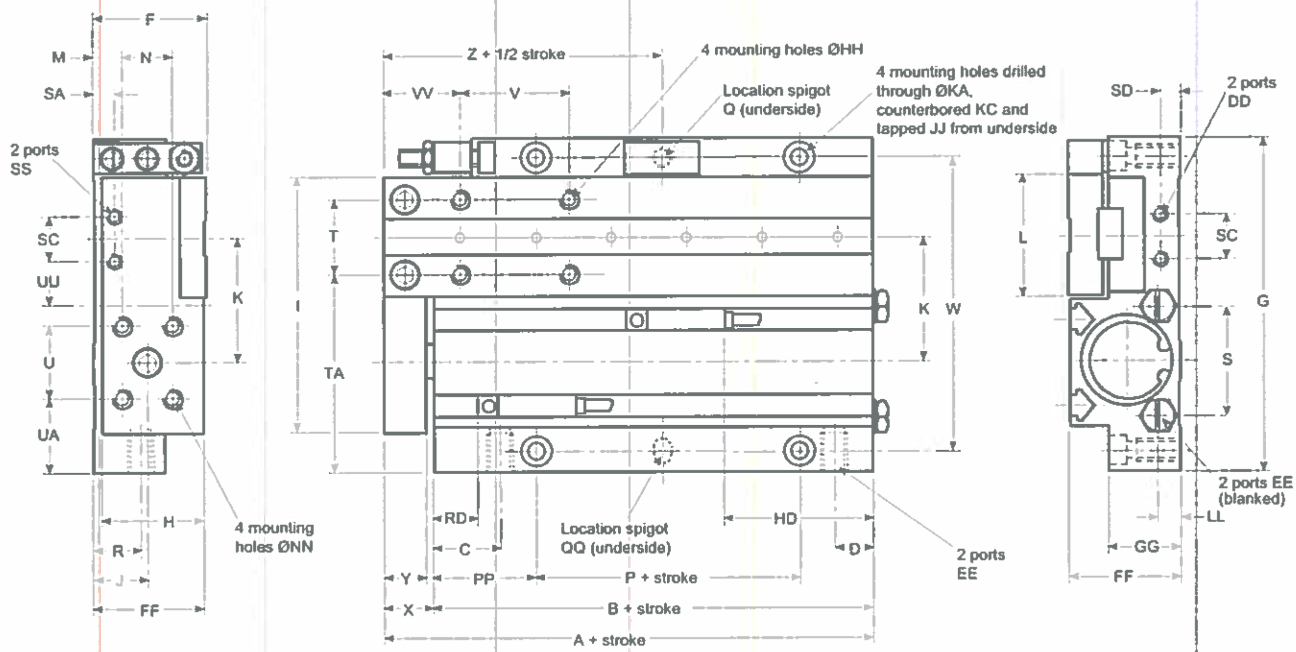
NOTE: *Connection 'DD' is for feeds to integral piping (3mm diameter) for operation of auxillary equipment.*

Magnetic sensor positions

Bore	Reed Switch KOH		Proximity switch K3H	
	HD	RD	HD	RD
10	21.0	8.0	20.0	9.0
16	31.5	10.5	30.5	11.5

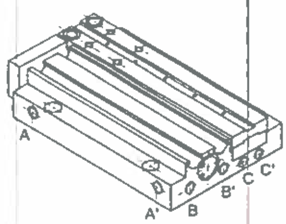
9. Installation dimensions in mm - LCY-A series (Integral piping)

20, 25mm bore



Porting details

Sketch showing port arrangement



Model	Port position	Application
LCY-A-20-*	A & A'	Cylinder operation
	B & B'	Cylinder operation
	C & C'	Integral piping connections for actuation of items fitted to end plate (grippers etc)
LCY-A-25-*	A & A'	Cylinder operation
	B & B'	Cylinder operation
	C & C'	Integral piping connections for actuation of items fitted to end plate (grippers etc)

Bore	A	B	C	D	DD	EE	F	FF	G	GG	H	HH	I	J	JJ	K
20	85	73	16	9	M5 x 0.8	M5 x 0.8	27	26	80	17	24	M4 x 8deep	60	13	M5 x 8deep	30
25	102	88	17	11	M5 x 0.8	M5 x 0.8	33	32	88	20	30	M5 x 10deep	67	16	M6 x 10deep	33.5

Bore	KA	KC	L	LL	M	N	NN	P	PP	Q	QQ	R	S	SA	SC
20	4.3	8.0Ø x 4.4deep	28	5.5	6	14	M4 x 10deep	32	24	6Ø x 6deep	6Ø x 6deep x 7long	12	25	5	9
25	5.2	9.5Ø x 5.4deep	34	5.5	8	18	M5 x 12deep	38	25	6Ø x 6deep	6Ø x 6deep x 7long	14	28	5	10

Bore	SD	SE	SS	T	TA	U	UA	UU	V	VV	W	X	Y	Z
20	5	51.5	M3 x 3deep	18	47	20	16	4	26	16	70	12	10	52
25	5	55.5	M3 x 3 deep	22	49.5	22	16	6	26	16	77	14	12	58

NOTE: Connection 'DD' is for feeds to integral piping (3mm diameter) for operation of auxiliary equipment.

Magnetic sensor positions

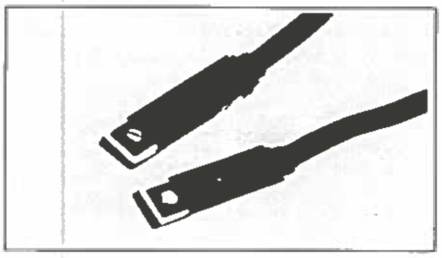
Bore	Reed Switch KOH		Proximity switch K3H	
	HD	RD	HD	RD1.5
20	35.5	13.5	34.5	14.5
25	50.0	14.0	49.0	15.0

Pneumatics

CKD Linear slide cylinders

Magnetic sensors - Reed switch Type K0H and Proximity switch Type K3H

6, 10, 16, 20, 20, 25, 32mm



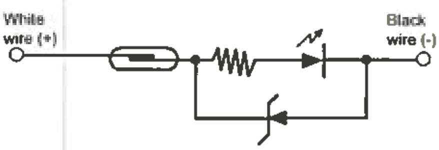
1. General description and application benefits

Continuously rated reed and proximity switches with LED indicator and flying lead.
Programmable controller relay operation.

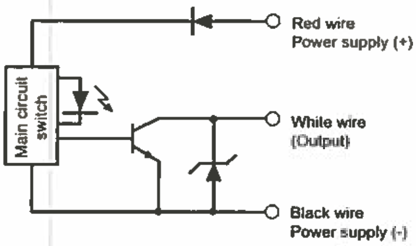
- Switches fit within cylinder body envelope.
- Integral LED indicator (Red)
- Ease of fitting.

2. Internal circuit diagrams of switches

Reed switch K0H*



Proximity switch K3H*



3. Preferred model selection

Reed switch

Model code	Description
K0H3	Axial lead wire reed switch with 3metre flying lead (Standard)
K0H5	Axial lead wire reed switch with 5 metre flying lead (Optional)

Proximity switch

Model code	Description
K3H3	Axial lead wire proximity switch (NPN) with 3metre flying lead (Standard)
K3H5	Axial lead wire proximity switch (NPN) with 5 metre flying lead (Optional)

4. Operating data

Ambient operating temperature range	-10° C to + 60° C (14 F to + 140° F)
Load voltage/current	K0H* - 12, 24vDC/ 5 to 50mA 110vAC/ 7 to 20mA K3H* - 30vDC or less/100mA or less
Power consumption	K3H* - 24vDC (ON) 10mA or less
Leakage current	K3H* - 10 μA or less
Maximum impulse	K0H* - 30G K3H* - 100G
Protection	IEC standard IP67
Lead wire	K0H* - Oil proof 2 core vinyl cabtyre cord 0.2mm^2 K3H* - Oil proof 3 core vinyl cabtyre cord 0.2mm^2
Insulation resistance	More than 20MΩ at 500v DC megger
LED indication	Red (ON)

5. Installation requirements

Reed switch K0H*

Magnetic environment
Avoid using at places with strong magnetic field and high current (large magnet, spot welder, etc.) in the surroundings. When making proximity connection of cylinders with switches in parallel, the magnetic substance moving at the vicinity of the cylinder may cause mutual interference, affecting the detecting accuracy.

Lead wire connection
Be sure to connect the lead wire of the switch to a load in series, instead of connecting it directly to the power source.

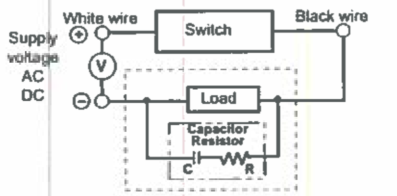
[A] For DC, white wire is the positive (+) side and the black wire the negative (-) side.
If connected inverse, the switch activates, but the lamp fails to light.

[B] To connect the lead wire to an AC relay or input terminal of the programmable controller, the lamp of the switch may not light if each circuit is half-wave rectification. In such cases reverse the polarity of the connection, then the lamp will light.

Contact capacity
Avoid using the load with the capacity exceeding the maximum contact capacity of the switch. When the current is below the rated current level, the switch lamp may fail to light.

Contact protection
When using for the inductive load (such as relay, etc.), be sure to install the contact protection circuits shown below.

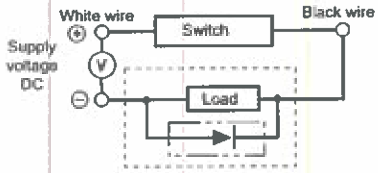
● When using capacitor and resistance



Wired by user

Protection circuit (spark quenching circuit)
Recommended value capacitor C 0.033 - 0.1μF
Resistor R 1 - 3KΩ
By Okaya Denki XEBIKI or equivalent

● When using diode

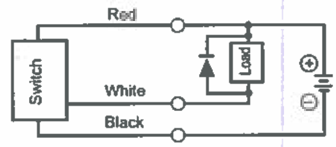


Wired by user

Protection
General rectifier diode
By Hitachi V06 or equivalent

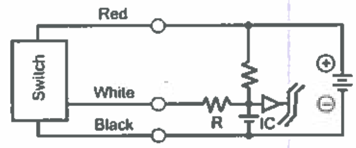
Proximity switch K3H*

Output circuit protection
When an inductive load (relay or solenoid valve) is connected, be sure to install the protection circuit shown below in order to protect from the surge voltage generated when the switch is turned OFF.



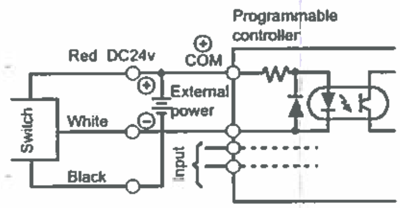
Example of surge absorbing element (diode) jointly used as the inductive load. Use Hitachi diode V06 or equivalent

When a capacitive load (condenser) is connected, be sure to install the protection circuit shown below in order to protect from the inrush current generated when the switch is turned ON.

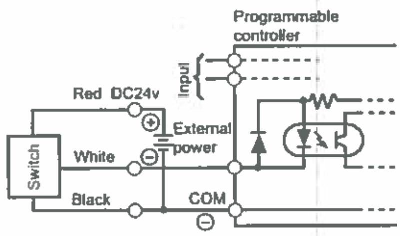


Example of the current limiting resistance R connected to the capacitive load, with the value of R (ohm) being above the value obtained by the equation V/0.10 = R (Ω)

Connection to programmable controller (sequencer)
The connecting method differs according to the type of programmable controller.
Make connections as shown below.

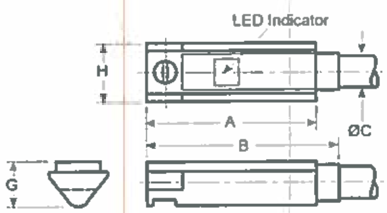


Example of switch K3H connection to source input (external power) type.*



Example of switch K3H connection to source input (built - in power) type.*
The switch cannot be connected to the sink input sequencer.

6. Installation dimensions in mm



Model code	A	B	C	G	H
K0H*	24	26.5	3.4	4.5	7.0
K3H*	24	26.5	3.4	4.5	7.0

VICKERS PNEUMATICS ARE IN CONTROL

By listening to our customers
and working as a team throughout
our business we will aim to provide

Total Customer Satisfaction

by striving to generate 'quality' in
everything we do, having the 'right'
products available
at the 'right' time, at the 'right' price
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backed up by people who 'care'.

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